

**CPC****COOPERATIVE PATENT CLASSIFICATION****C07D****HETEROCYCLIC COMPOUNDS****Heterocyclic compounds having only nitrogen as ring hetero atom**

- C07D 201/00**      **Preparation, separation, purification or stabilisation of unsubstituted lactams**
- C07D 201/02      . Preparation of lactams
- C07D 201/04      . . from or via oximes by Beckmann rearrangement
- C07D 201/06      . . . from ketones by simultaneous oxime formation and rearrangement
- C07D 201/08      . . from carboxylic acids or derivatives thereof, e.g. hydroxycarboxylic acids, lactones, nitriles
- C07D 201/10      . . from cycloaliphatic compounds by simultaneous nitrosylation and rearrangement
- C07D 201/12      . . by depolymerising polyamides
- C07D 201/14      . Preparation of salts or adducts of lactams
- C07D 201/16      . Separation or purification ([separation of inorganic salts C01](#))
- C07D 201/18      . Stabilisation

**Heterocyclic compounds having only nitrogen as ring hetero atom**

- C07D 203/00**      **Heterocyclic compounds containing three-membered rings with one nitrogen atom as the only ring hetero atom**
- C07D 203/02      . Preparation by ring-closure
- C07D 203/04      . not condensed with other rings
- C07D 203/06      . . having no double bonds between ring members or between ring members and non-ring members
- C07D 203/08      . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring nitrogen atom
- C07D 203/10      . . . . Radicals substituted by singly bound oxygen atoms
- C07D 203/12      . . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
- C07D 203/14      . . . . with carbocyclic rings directly attached to the ring nitrogen atom
- C07D 203/16      . . . with acylated ring nitrogen atoms
- C07D 203/18      . . . . by carboxylic acids, or by sulfur or nitrogen analogues thereof
- C07D 203/20      . . . . by carbonic acid, or by sulfur or nitrogen analogues thereof, e.g. carbamates
- C07D 203/22      . . . with hetero atoms directly attached to the ring nitrogen atom
- C07D 203/24      . . . . Sulfur atoms
- C07D 203/26      . condensed with carbocyclic rings or ring systems
- C07D 205/00**      **Heterocyclic compounds containing four-membered rings with one nitrogen atom as the only ring hetero atom**

- C07D 205/02
  - not condensed with other rings
- C07D 205/04
  - • having no double bonds between ring members or between ring members and non-ring members
- C07D 205/06
  - • having one double bond between ring members or between a ring member and a non-ring member
- C07D 205/08
  - • • with one oxygen atom directly attached in position 2, e.g. beta-lactams
- C07D 205/085
  - • • • with a nitrogen atom directly attached in position 3
- C07D 205/09
  - • • • with a sulfur atom directly attached in position 4
- C07D 205/095
  - • • • • and with a nitrogen atom directly attached in position 3
- C07D 205/10
  - • having two double bonds between ring members or between ring members and non-ring members
- C07D 205/12
  - condensed with carbocyclic rings or ring systems

**C07D 207/00 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](#)

- C07D 207/02
  - with only hydrogen or carbon atoms directly attached to the ring nitrogen atom
- C07D 207/04
  - • having no double bonds between ring members or between ring members and non-ring members
- C07D 207/06
  - • • with radicals, containing only hydrogen and carbon atoms, attached to ring carbon atoms
- C07D 207/08
  - • • with hydrocarbon radicals, substituted by hetero atoms, attached to ring carbon atoms
- C07D 207/09
  - • • • Radicals substituted by nitrogen atoms, not forming part of a nitro radical
- C07D 207/10
  - • • 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
- C07D 207/12
  - • • • Oxygen or sulfur atoms
- C07D 207/14
  - • • • Nitrogen atoms not forming part of a nitro radical
- C07D 207/16
  - • • • Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- C07D 207/18
  - • having one double bond between ring members or between a ring member and a non-ring member
- C07D 207/20
  - • • with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 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
- C07D 207/24
  - • • • Oxygen or sulfur atoms
- C07D 207/26
  - • • • • 2-Pyrrolidones
- C07D 207/263
  - • • • • with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms

C07D 207/267	. . . . .	with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to the ring nitrogen atom
C07D 207/27	. . . . .	with substituted hydrocarbon radicals directly attached to the ring nitrogen atom
C07D 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
C07D 207/277	. . . . .	Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
C07D 207/28	. . . . .	2-Pyrrolidone-5- carboxylic acids; Functional derivatives thereof, e.g. esters, nitriles
C07D 207/30	. .	having two double bonds between ring members or between ring members and non-ring members
C07D 207/32	. . .	with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
C07D 207/323	. . . .	with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to the ring nitrogen atoms
C07D 207/325	. . . .	with substituted hydrocarbon radicals directly attached to the ring nitrogen atom
C07D 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
C07D 207/33	. . . .	with substituted hydrocarbon radicals, directly attached to ring carbon atoms
C07D 207/333	. . . . .	Radicals substituted by oxygen or sulfur atoms
C07D 207/335	. . . . .	Radicals substituted by nitrogen atoms not forming part of a nitro radical
C07D 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
C07D 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
C07D 207/36	. . . .	Oxygen or sulfur atoms
C07D 207/38	. . . . .	2-Pyrrolones
C07D 207/40	. . . . .	2,5-Pyrrolidine-diones
C07D 207/404	. . . . .	with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms, e.g. succinimide
C07D 207/408	. . . . .	Radicals containing only hydrogen and carbon atoms attached to ring carbon atoms
C07D 207/412	. . . . .	Acyclic radicals containing more than six carbon atoms
C07D 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
C07D 207/42	. . . .	Nitro radicals

- C07D 207/44
  - . . having three double bonds between ring members or between ring members and non-ring members
- C07D 207/444
  - . . . having two doubly-bound oxygen atoms directly attached in positions 2 and 5
- C07D 207/448
  - . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms, e.g. maleimide
- C07D 207/452
  - . . . . . with hydrocarbon radicals, substituted by hetero atoms, directly attached to the ring nitrogen atom
- C07D 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
- C07D 207/46
  - . with hetero atoms directly attached to the ring nitrogen atom
- C07D 207/48
  - . . Sulfur atoms
- C07D 207/50
  - . . Nitrogen atoms
- C07D 209/00**
  - Heterocyclic compounds containing five-membered rings, condensed with other rings, with one nitrogen atom as the only ring hetero atom**
- C07D 209/02
  - . condensed with one carbocyclic ring
- C07D 209/04
  - . . Indoles; Hydrogenated indoles
- C07D 209/06
  - . . . Preparation of indole from coal-tar
- C07D 209/08
  - . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to carbon atoms of the hetero ring
- C07D 209/10
  - . . . with substituted hydrocarbon radicals attached to carbon atoms of the hetero ring
- C07D 209/12
  - . . . . Radicals substituted by oxygen atoms
- C07D 209/14
  - . . . . Radicals substituted by nitrogen atoms, not forming part of a nitro radical
- C07D 209/16
  - . . . . . Tryptamines
- C07D 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
- C07D 209/20
  - . . . . . substituted additionally by nitrogen atoms, e.g. tryptophane
- C07D 209/22
  - . . . . . with an aralkyl radical attached to the ring nitrogen atom
- C07D 209/24
  - . . . . . with an alkyl or cycloalkyl radical attached to the ring nitrogen atom
- C07D 209/26
  - . . . . . with an acyl radical attached to the ring nitrogen atom
- C07D 209/28
  - . . . . . . 1-(4-Chlorobenzoyl)-2-methyl-indolyl-3-acetic acid, substituted in position 5 by an oxygen or nitrogen atom; Esters thereof
- C07D 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
- C07D 209/32
  - . . . . Oxygen atoms
- C07D 209/34
  - . . . . . in position 2
- C07D 209/36
  - . . . . . in position 3, e.g. adrenochrome
- C07D 209/38
  - . . . . . in position 2 and 3, e.g. isatin

- C07D 209/40 . . . . Nitrogen atoms, not forming part of a nitro radical, e.g. isatin semicarbazone
- C07D 209/42 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- C07D 209/43 . . . with an  $-OCH_2CH(OH)CH_2NH_2$  radical, which may be further substituted, attached in positions 4, 5, 6 or 7
- C07D 209/44 . . Iso-indoles; Hydrogenated iso-indoles
- C07D 209/46 . . . with an oxygen atom in position 1
- C07D 209/48 . . . with oxygen atoms in positions 1 and 3, e.g. phthalimide
- C07D 209/49 . . . . and having in the molecule an acyl radical containing a saturated three-membered ring, e.g. chrysanthemic acid esters
- C07D 209/50 . . . with oxygen and nitrogen atoms in positions 1 and 3
- C07D 209/52 . . condensed with a ring other than six-membered
- C07D 209/54 . . Spiro-condensed
- C07D 209/56 . Ring systems containing three or more rings
- C07D 209/58 . . [b]- or [c]-condensed
- C07D 209/60 . . . Naphtho [b] pyrroles; Hydrogenated naphtho [b] pyrroles
- C07D 209/62 . . . Naphtho [c] pyrroles; Hydrogenated naphtho [c] pyrroles
- C07D 209/64 . . . . with an oxygen atom in position 1
- C07D 209/66 . . . . with oxygen atoms in positions 1 and 3
- C07D 209/68 . . . . with oxygen and nitrogen atoms in positions 1 and 3
- C07D 209/70 . . . containing carbocyclic rings other than six-membered
- C07D 209/72 . . . 4,7-Endo-alkylene-iso-indoles
- C07D 209/74 . . . . with an oxygen atom in position 1
- C07D 209/76 . . . . with oxygen atoms in positions 1 and 3
- C07D 209/78 . . . . with oxygen and nitrogen atoms in positions 1 and 3
- C07D 209/80 . . [b, c]- or [b, d]-condensed
- C07D 209/82 . . . Carbazoles; Hydrogenated carbazoles
- C07D 209/84 . . . . Separation, e.g. from tar; Purification
- C07D 209/86 . . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the ring system
- C07D 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
- C07D 209/90 . . . Benzo [c, d] indoles; Hydrogenated benzo [c, d] indoles
- C07D 209/92 . . . . Naphthostyrils
- C07D 209/94 . . . containing carbocyclic rings other than six-membered
- C07D 209/96 . . Spiro-condensed ring systems

**C07D 211/00 Heterocyclic compounds containing hydrogenated pyridine rings, not condensed with other rings**

**NOTES**

## C07D 211/00

(continued)

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](#)

## C07D 211/02

- Preparation by ring-closure or hydrogenation

## C07D 211/04

- with only hydrogen or carbon atoms directly attached to the ring nitrogen atom

## C07D 211/06

- . having no double bonds between ring members or between ring members and non-ring members

## C07D 211/08

- . . with hydrocarbon or substituted hydrocarbon radicals directly attached to ring carbon atoms

## C07D 211/10

- . . . with radicals containing only carbon and hydrogen atoms attached to ring carbon atoms

## C07D 211/12

- . . . . with only hydrogen atoms attached to the ring nitrogen atom

## C07D 211/14

- . . . . with hydrocarbon or substituted hydrocarbon radicals attached to the ring nitrogen atom

## C07D 211/16

- . . . . with acylated ring nitrogen atom

## C07D 211/18

- . . . . with substituted hydrocarbon radicals attached to ring carbon atoms

## C07D 211/20

- . . . . with hydrocarbon radicals, substituted by singly bound oxygen or sulfur atoms ([bound to the same carbon atom C07D 211/30](#))

## C07D 211/22

- . . . . . by oxygen atoms

## C07D 211/24

- . . . . . by sulfur atoms to which a second hetero atom is attached

## C07D 211/26

- . . . . with hydrocarbon radicals, substituted by nitrogen atoms

## C07D 211/28

- . . . . . to which a second hetero atom is attached

## C07D 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

## C07D 211/32

- . . . . . by oxygen atoms

## C07D 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

## C07D 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

## C07D 211/38

- . . . . Halogen atoms or nitro radicals

## C07D 211/40

- . . . . Oxygen atoms

## C07D 211/42

- . . . . . attached in position 3 or 5

## C07D 211/44

- . . . . . attached in position 4

## C07D 211/46

- . . . . . having a hydrogen atom as the second substituent in position 4

## C07D 211/48

- . . . . . having an acyclic carbon atom attached in position 4

## C07D 211/50

- . . . . . Aroyl radical

## C07D 211/52

- . . . . . having an aryl radical as the second substituent in position 4

## C07D 211/54

- . . . . Sulfur atoms

## C07D 211/56

- . . . . Nitrogen atoms ([nitro radicals C07D 211/38](#))

- C07D 211/58 . . . . . attached in position 4
- C07D 211/60 . . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- C07D 211/62 . . . . . attached in position 4
- C07D 211/64 . . . . . having an aryl radical as the second substituent in position 4
- C07D 211/66 . . . . . having a hetero atom as the second substituent in position 4
- C07D 211/68 . . . having one double bond between ring members or between a ring member and a non-ring member
- C07D 211/70 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 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
- C07D 211/74 . . . . . Oxygen atoms
- C07D 211/76 . . . . . attached in position 2 or 6
- C07D 211/78 . . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- C07D 211/80 . . . having two double bonds between ring members or between ring members and non-ring members
- C07D 211/82 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 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
- C07D 211/86 . . . . . Oxygen atoms
- C07D 211/88 . . . . . attached in positions 2 and 6, e.g. glutarimide
- C07D 211/90 . . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- C07D 211/92 . . . with a hetero atom directly attached to the ring nitrogen atom
- C07D 211/94 . . . Oxygen atom, e.g. piperidine N-oxide
- C07D 211/96 . . . Sulfur atom
- C07D 211/98 . . . Nitrogen atom
- C07D 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**
- C07D 213/02 . . . having three double bonds between ring members or between ring members and non-ring members
- C07D 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
- C07D 213/06 . . . containing only hydrogen and carbon atoms in addition to the ring nitrogen atom
- C07D 213/08 . . . . . Preparation by ring-closure
- C07D 213/09 . . . . . involving the use of ammonia, amines, amine salts, or nitriles



C07D 213/10	. . . . .	from acetaldehyde or cyclic polymers thereof
C07D 213/12	. . . . .	from unsaturated compounds
C07D 213/127	. . . . .	Preparation from compounds containing pyridine rings
C07D 213/133	. . . . .	Preparation by dehydrogenation of hydrogenated pyridine compounds
C07D 213/14	. . . . .	Preparation from compounds containing heterocyclic oxygen
C07D 213/16	. . . . .	Containing only one pyridine ring
C07D 213/18	. . . . .	Salts thereof
C07D 213/20	. . . . .	Quaternary compounds thereof
C07D 213/22	. . . . .	containing two or more pyridine rings directly linked together, e.g. bipyridyl
C07D 213/24	. . . . .	with substituted hydrocarbon radicals attached to ring carbon atoms
C07D 213/26	. . . . .	Radicals substituted by halogen atoms or nitro radicals
C07D 213/28	. . . . .	Radicals substituted by singly-bound oxygen or sulfur atoms ( <a href="#">bound to the same carbon atom C07D 213/44</a> )
C07D 213/30	. . . . .	Oxygen atoms
C07D 213/32	. . . . .	Sulfur atoms
C07D 213/34	. . . . .	to which a second heteroatom is attached
C07D 213/36	. . . . .	Radicals substituted by singly-bound nitrogen atoms ( <a href="#">nitro radicals C07D 213/26</a> )
C07D 213/38	. . . . .	having only hydrogen, hydrocarbon radicals attached to the substituent nitrogen atom
C07D 213/40	. . . . .	Acylated substituent nitrogen atom
C07D 213/42	. . . . .	having hetero atoms attached to the substituent nitrogen atom ( <a href="#">nitro radicals C07D 213/26</a> )
C07D 213/44	. . . . .	Radicals substituted by doubly-bound oxygen, sulfur, or nitrogen atoms, or by two such atoms singly-bound to the same carbon atom
C07D 213/46	. . . . .	Oxygen atoms
C07D 213/48	. . . . .	Aldehydo radicals
C07D 213/50	. . . . .	Ketonic radicals
C07D 213/51	. . . . .	Acetal radicals
C07D 213/52	. . . . .	Sulfur atoms
C07D 213/53	. . . . .	Nitrogen atoms
C07D 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
C07D 213/55	. . . . .	Acids; Esters
C07D 213/56	. . . . .	Amides
C07D 213/57	. . . . .	Nitriles
C07D 213/58	. . . . .	Amidines
C07D 213/59	. . . . .	with at least one of the bonds being to sulfur
C07D 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



C07D 213/61	. . . .	Halogen atoms or nitro radicals
C07D 213/62	. . . .	Oxygen or sulfur atoms
C07D 213/63	. . . . .	One oxygen atom
C07D 213/64	. . . . .	attached in position 2 or 6
C07D 213/643	. . . . .	2-Phenoxypyridines; Derivatives thereof
C07D 213/647	. . . . .	and having in the molecule an acyl radical containing a saturated three-membered ring, e.g. chrysanthemumic acid esters
C07D 213/65	. . . . .	attached in position 3 or 5
C07D 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
C07D 213/67	. . . . .	2-Methyl-3-hydroxy-4,5-bis(hydroxy-methyl)pyridine, i.e. pyridoxine
C07D 213/68	. . . . .	attached in position 4
C07D 213/69	. . . . .	Two or more oxygen atoms
C07D 213/70	. . . . .	Sulfur atoms
C07D 213/71	. . . . .	to which a second hetero atom is attached
C07D 213/72	. . . . .	Nitrogen atoms ( <a href="#">nitro radicals C07D 213/61</a> )
C07D 213/73	. . . . .	Unsubstituted amino or imino radicals
C07D 213/74	. . . . .	Amino or imino radicals substituted by hydrocarbon or substituted hydrocarbon radicals
C07D 213/75	. . . . .	Amino or imino radicals, acylated by carboxylic or carbonic acids, or by sulfur or nitrogen analogues thereof, e.g. carbamates
C07D 213/76	. . . . .	to which a second hetero atom is attached ( <a href="#">nitro radicals C07D 213/61</a> )
C07D 213/77	. . . . .	Hydrazine radicals
C07D 213/78	. . . . .	Carbon atoms having three bonds to hetero atoms, with at the most one to halogen, e.g. ester or nitrile radicals
C07D 213/79	. . . . .	Acids; Esters
C07D 213/80	. . . . .	in position 3
C07D 213/803	. . . . .	Processes of preparation
C07D 213/807	. . . . .	by oxidation of pyridines or condensed pyridines
C07D 213/81	. . . . .	Amides; Imides
C07D 213/82	. . . . .	in position 3
C07D 213/83	. . . . .	Thio-acids; Thio-esters; Thio-amides; Thio-imides
C07D 213/84	. . . . .	Nitriles
C07D 213/85	. . . . .	in position 3
C07D 213/86	. . . . .	Hydrazides; Thio or imino analogues thereof
C07D 213/87	. . . . .	in position 3
C07D 213/88	. . . . .	Nicotinoylhydrazones
C07D 213/89	. .	with hetero atoms directly attached to the ring nitrogen atom

- C07D 213/90
  - having more than three double bonds between ring members or between ring members and non-ring members
- C07D 215/00 Heterocyclic compounds containing quinoline or hydrogenated quinoline ring systems**
- C07D 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
- C07D 215/04
  - with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to the ring carbon atoms
- C07D 215/06
  - having only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to the ring nitrogen atom
- C07D 215/08
  - with acylated ring nitrogen atom
- C07D 215/10
  - Quaternary compounds
- C07D 215/12
  - with substituted hydrocarbon radicals attached to ring carbon atoms
- C07D 215/14
  - Radicals substituted by oxygen atoms
- C07D 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
- C07D 215/18
  - Halogen atoms or nitro radicals
- C07D 215/20
  - Oxygen atoms ([quinophthalones C09B 25/00](#))
- C07D 215/22
  - attached in position 2 or 4
- C07D 215/227
  - only one oxygen atom which is attached in position 2
- C07D 215/233
  - only one oxygen atom which is attached in position 4
- C07D 215/24
  - attached in position 8
- C07D 215/26
  - Alcohols; Ethers thereof
- C07D 215/28
  - with halogen atoms or nitro radicals in positions 5, 6 or 7
- C07D 215/30
  - Metal salts; Chelates
- C07D 215/32
  - Esters
- C07D 215/34
  - Carbamates
- C07D 215/36
  - Sulfur atoms ([C07D 215/24 takes precedence](#))
- C07D 215/38
  - Nitrogen atoms ([nitro radicals C07D 215/18](#))
- C07D 215/40
  - attached in position 8
- C07D 215/42
  - attached in position 4
- C07D 215/44
  - with aryl radicals attached to said nitrogen atoms
- C07D 215/46
  - with hydrocarbon radicals, substituted by nitrogen atoms, attached to said nitrogen atoms
- C07D 215/48
  - Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- C07D 215/50
  - attached in position 4
- C07D 215/52
  - with aryl radicals attached in position 2
- C07D 215/54
  - attached in position 3
- C07D 215/56
  - with oxygen atoms in position 4

C07D 215/58 . with hetero atoms directly attached to the ring nitrogen atom

C07D 215/60 . . N-oxides

**C07D 217/00 Heterocyclic compounds containing isoquinoline or hydrogenated isoquinoline ring systems**

C07D 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

C07D 217/04 . . with hydrocarbon or substituted hydrocarbon radicals attached to the ring nitrogen atom

C07D 217/06 . . with the ring nitrogen atom acylated by carboxylic or carbonic acids, or with sulfur or nitrogen analogues thereof, e.g. carbamates

C07D 217/08 . . with a hetero atom directly attached to the ring nitrogen atom

C07D 217/10 . . Quaternary compounds

C07D 217/12 . with radicals, substituted by hetero atoms, attached to carbon atoms of the nitrogen-containing ring

C07D 217/14 . . other than aralkyl radicals

C07D 217/16 . . . substituted by oxygen atoms

C07D 217/18 . . Aralkyl radicals

C07D 217/20 . . . with oxygen atoms directly attached to the aromatic ring of said aralkyl radical, e.g. papaverine

C07D 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

C07D 217/24 . . Oxygen atoms

C07D 217/26 . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen

**C07D 219/00 Heterocyclic compounds containing acridine or hydrogenated acridine ring systems**

C07D 219/02 . with only hydrogen, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the ring system

C07D 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

C07D 219/06 . . Oxygen atoms

C07D 219/08 . . Nitrogen atoms ([acridine dyes C09B 15/00](#))

C07D 219/10 . . . attached in position 9

C07D 219/12 . . . . Amino-alkyl-amino radicals attached in position 9

C07D 219/14 . with hydrocarbon radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom

C07D 219/16 . with acyl radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom

**C07D 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](#) to [C07D 219/00](#)**

- C07D 221/02      .   condensed with carbocyclic rings or ring systems
- C07D 221/04      . .   ortho- or peri-condensed ring systems
- C07D 221/06      . . .   Ring systems of three rings
- C07D 221/08      . . . .   Aza-anthracenes ([acridine C07D 219/00](#))
- C07D 221/10      . . . .   Aza-phenanthrenes
- C07D 221/12      . . . . .   Phenanthridines
- C07D 221/14      . . . .   Aza-phenalenes, e.g. 1,8-naphthalimide
- C07D 221/16      . . . .   containing carbocyclic rings other than six-membered
- C07D 221/18      . . .   Ring systems of four or more rings
- C07D 221/20      . .   Spiro-condensed ring systems
- C07D 221/22      . .   Bridged ring systems
- C07D 221/24      . . .   Camphidines
- C07D 221/26      . . .   Benzomorphans
- C07D 221/28      . . .   Morphinans

**C07D 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](#)

- C07D 223/02      .   not condensed with other rings
- C07D 223/04      . .   with only hydrogen atoms, halogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 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](#))
- C07D 223/08      . . .   Oxygen atoms
- C07D 223/10      . . . .   attached in position 2
- C07D 223/12      . . .   Nitrogen atoms not forming part of a nitro radical
- C07D 223/14      .   condensed with carbocyclic rings or ring systems
- C07D 223/16      . .   Benzazepines; Hydrogenated benzazepines
- C07D 223/18      . .   Dibenzazepines; Hydrogenated dibenzazepines
- C07D 223/20      . . .   Dibenz [b, e] azepines; Hydrogenated dibenz [b, e] azepines
- C07D 223/22      . . .   Dibenz [b, f] azepines; Hydrogenated dibenz [b, f] azepines
- C07D 223/24      . . . .   with hydrocarbon radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom
- C07D 223/26      . . . . .   having a double bond between positions 10 and 11
- C07D 223/28      . . . . .   having a single bond between positions 10 and 11

- C07D 223/30 . . . . with hetero atoms directly attached to the ring nitrogen atom
- C07D 223/32 . . containing carbocyclic rings other than six-membered

**C07D 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](#)

- C07D 225/02 . not condensed with other rings
- C07D 225/04 . condensed with carbocyclic rings or ring systems
- C07D 225/06 . . condensed with one six-membered ring
- C07D 225/08 . . condensed with two six-membered rings

**C07D 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](#) to [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](#)

- C07D 227/02 . with only hydrogen or carbon atoms directly attached to the ring nitrogen atom
- C07D 227/04 . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to ring carbon atoms
- C07D 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
- C07D 227/08 . . . Oxygen atoms
- C07D 227/087 . . . . One doubly-bound oxygen atom in position 2, e.g. lactams
- C07D 227/093 . . . . Two doubly-bound oxygen atoms attached to the carbon atoms adjacent to the ring nitrogen atom, e.g. dicarboxylic acid imides
- C07D 227/10 . . . Nitrogen atoms not forming part of a nitro radical
- C07D 227/12 . with hetero atoms directly attached to the ring nitrogen atom

**C07D 229/00 Heterocyclic compounds containing rings of less than five members having two nitrogen atoms as the only ring hetero atoms**

- C07D 229/02 . containing three-membered rings

**C07D 231/00 Heterocyclic compounds containing 1,2-diazole or hydrogenated 1,2-diazole rings**

- C07D 231/02 . not condensed with other rings
- C07D 231/04 . . having no double bonds between ring members or between ring members and non-ring members
- C07D 231/06 . . having one double bond between ring members or between ring members and non-ring members

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

- C07D 233/10 . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring nitrogen atoms
- C07D 233/12 . . . . with substituted hydrocarbon radicals attached to ring nitrogen atoms
- C07D 233/14 . . . . Radicals substituted by oxygen atoms
- C07D 233/16 . . . . Radicals substituted by nitrogen atoms
- C07D 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
- C07D 233/20 . . with substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 233/22 . . . Radicals substituted by oxygen atoms
- C07D 233/24 . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
- C07D 233/26 . . . Radicals substituted by carbon atoms having three bonds to hetero atoms
- C07D 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
- C07D 233/30 . . . Oxygen or sulfur atoms
- C07D 233/32 . . . . One oxygen atom
- C07D 233/34 . . . . ethylene-urea
- C07D 233/36 . . . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to ring nitrogen atoms
- C07D 233/38 . . . . with acyl radicals or hetero atoms directly attached to ring nitrogen atoms
- C07D 233/40 . . . . Two or more oxygen atoms
- C07D 233/42 . . . . Sulfur atoms
- C07D 233/44 . . . Nitrogen atoms not forming part of a nitro radical
- C07D 233/46 . . . . with only hydrogen atoms attached to said nitrogen atoms
- C07D 233/48 . . . . with acyclic hydrocarbon or substituted acyclic hydrocarbon radicals, attached to said nitrogen atoms
- C07D 233/50 . . . . with acyclic hydrocarbon or substituted acyclic hydrocarbon radicals, attached to said nitrogen atoms
- C07D 233/52 . . . . with hetero atoms directly attached to said nitrogen atoms
- C07D 233/54 . . having two double bonds between ring members or between ring members and non-ring members
- C07D 233/56 . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to ring carbon atoms
- C07D 233/58 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to ring nitrogen atoms
- C07D 233/60 . . . with hydrocarbon radicals, substituted by oxygen or sulfur atoms, attached to ring nitrogen atoms
- C07D 233/61 . . . with hydrocarbon radicals, substituted by nitrogen atoms not forming part of a nitro radical, attached to ring nitrogen atoms
- C07D 233/62 . . . with triarylmethyl radicals attached to ring nitrogen atoms ([triarylmethane dyes C09B 11/26](#))
- C07D 233/64 . . with substituted hydrocarbon radicals attached to ring carbon atoms, e.g. histidine



- C07D 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
- C07D 233/68
  - Halogen atoms
- C07D 233/70
  - One oxygen atom
- C07D 233/72
  - Two oxygen atoms, e.g. hydantoin
- C07D 233/74
  - with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to other ring members
- C07D 233/76
  - with substituted hydrocarbon radicals attached to the third ring carbon atom
- C07D 233/78
  - Radicals substituted by oxygen atoms
- C07D 233/80
  - with hetero atoms or acyl radicals directly attached to ring nitrogen atoms
- C07D 233/82
  - Halogen atoms
- C07D 233/84
  - Sulfur atoms
- C07D 233/86
  - Oxygen and sulfur atoms, e.g. thiohydantoin
- C07D 233/88
  - Nitrogen atoms, e.g. allantoin ([nitro radicals C07D 233/91](#))
- C07D 233/90
  - Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- C07D 233/91
  - Nitro radicals
- C07D 233/92
  - attached in position 4 or 5
- C07D 233/93
  - with hydrocarbon radicals, substituted by halogen atoms, attached to other ring members
- C07D 233/94
  - with hydrocarbon radicals, substituted by oxygen or sulfur atoms, attached to other ring members
- C07D 233/95
  - with hydrocarbon radicals, substituted by nitrogen atoms, attached to other ring members
- C07D 233/96
  - having three double bonds between ring members or between ring members and non-ring members
- C07D 235/00**
  - Heterocyclic compounds containing 1,3-diazole or hydrogenated 1,3-diazole rings, condensed with other rings**
- C07D 235/02
  - condensed with carbocyclic rings or ring systems
- C07D 235/04
  - Benzimidazoles; Hydrogenated benzimidazoles
- C07D 235/06
  - with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached in position 2
- C07D 235/08
  - Radicals containing only hydrogen and carbon atoms
- C07D 235/10
  - Radicals substituted by halogen atoms or nitro radicals
- C07D 235/12
  - Radicals substituted by oxygen atoms
- C07D 235/14
  - Radicals substituted by nitrogen atoms ([by nitro radicals C07D 235/10](#))
- C07D 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
- C07D 235/18
  - with aryl radicals directly attached in position 2

- C07D 235/20
  - . . . Two benzimidazolyl-2 radicals linked together directly or via a hydrocarbon or substituted hydrocarbon radical
- C07D 235/22
  - . . . with hetero atoms directly attached to ring nitrogen atoms ([C07D 235/10 takes precedence](#))
- C07D 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
- C07D 235/26
  - . . . . Oxygen atoms
- C07D 235/28
  - . . . . Sulfur atoms
- C07D 235/30
  - . . . . Nitrogen atoms not forming part of a nitro radical
- C07D 235/32
  - . . . . . Benzimidazole-2-carbamic acids, unsubstituted or substituted; Esters thereof; Thio-analogues thereof

**C07D 237/00 Heterocyclic compounds containing 1,2-diazine or hydrogenated 1,2-diazine rings**

- C07D 237/02
  - . not condensed with other rings
- C07D 237/04
  - . . having less than three double bonds between ring members or between ring members and non-ring members
- C07D 237/06
  - . . having three double bonds between ring members or between ring members and non-ring members
- C07D 237/08
  - . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 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
- C07D 237/12
  - . . . . Halogen atoms or nitro radicals
- C07D 237/14
  - . . . . Oxygen atoms
- C07D 237/16
  - . . . . . Two oxygen atoms
- C07D 237/18
  - . . . . Sulfur atoms
- C07D 237/20
  - . . . . Nitrogen atoms ([nitro radicals C07D 237/12](#))
- C07D 237/22
  - . . . . Nitrogen and oxygen atoms
- C07D 237/24
  - . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- C07D 237/26
  - . condensed with carbocyclic rings or ring systems
- C07D 237/28
  - . . Cinnolines
- C07D 237/30
  - . . Phthalazines
- C07D 237/32
  - . . . with oxygen atoms directly attached to carbon atoms of the nitrogen-containing ring
- C07D 237/34
  - . . . with nitrogen atoms directly attached to carbon atoms of the nitrogen-containing ring, e.g. hydrazine radicals
- C07D 237/36
  - . . Benzo-cinnolines

**C07D 239/00 Heterocyclic compounds containing 1,3-diazine or hydrogenated 1,3-diazine rings**

- C07D 239/02
  - . not condensed with other rings

- C07D 239/04
  - . . having no double bonds between ring members or between ring members and non-ring members
- C07D 239/06
  - . . having one double bond between ring members or between a ring member and a non-ring member
- C07D 239/08
  - . . . with heteroatoms directly attached in position 2
- C07D 239/10
  - . . . . Oxygen or sulfur atoms
- C07D 239/12
  - . . . . Nitrogen atoms not forming part of a nitro radical
- C07D 239/14
  - . . . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals attached to said nitrogen atoms
- C07D 239/16
  - . . . . . acylated on said nitrogen atoms
- C07D 239/18
  - . . . . . with hetero atoms attached to said nitrogen atoms, except nitro radicals, e.g. hydrazine radicals
- C07D 239/20
  - . . having two double bonds between ring members or between ring members and non-ring members
- C07D 239/22
  - . . . with hetero atoms directly attached to ring carbon atoms
- C07D 239/24
  - . . having three or more double bonds between ring members or between ring members and non-ring members
- C07D 239/26
  - . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 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
- C07D 239/30
  - . . . . Halogen atoms or nitro radicals
- C07D 239/32
  - . . . . One oxygen, sulfur or nitrogen atom
- C07D 239/34
  - . . . . . One oxygen atom
- C07D 239/36
  - . . . . . . as doubly bound atom or as unsubstituted hydroxy radical
- C07D 239/38
  - . . . . . One sulfur atom
- C07D 239/40
  - . . . . . . as doubly bound sulfur atom or as unsubstituted mercapto radical
- C07D 239/42
  - . . . . . One nitrogen atom ([nitro radicals C07D 239/30](#); [benzenesulfonamido-pyrimidines C07D 239/69](#))
- C07D 239/46
  - . . . . . Two or more oxygen, sulfur or nitrogen atoms ([benzenesulfonamido-pyrimidines C07D 239/69](#))
- C07D 239/47
  - . . . . . One nitrogen atom and one oxygen or sulfur atom, e.g. cytosine
- C07D 239/48
  - . . . . . Two nitrogen atoms
- C07D 239/49
  - . . . . . . with an aralkyl radical, or substituted aralkyl radical, attached in position 5, e.g. trimethoprim
- C07D 239/50
  - . . . . . Three nitrogen atoms
- C07D 239/52
  - . . . . . Two oxygen atoms
- C07D 239/54
  - . . . . . . as doubly bound oxygen atoms or as unsubstituted hydroxy radicals
- C07D 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

- C07D 239/553 . . . . . with halogen atoms or nitro radicals directly attached to ring carbon atoms, e.g. fluorouracil
- C07D 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
- C07D 239/56 . . . . . One oxygen atom and one sulfur atom
- C07D 239/58 . . . . . Two sulfur atoms
- C07D 239/60 . . . . . Three or more oxygen or sulfur atoms
- C07D 239/62 . . . . . Barbituric acids
- C07D 239/64 . . . . . Salts of organic bases; Organic double compounds
- C07D 239/66 . . . . . Thiobarbituric acids
- C07D 239/68 . . . . . Salts or organic bases; Organic double compounds
- C07D 239/69 . . . . . Benzenesulfonamido-pyrimidines
- C07D 239/70 . . . . . condensed with carbocyclic rings or ring systems
- C07D 239/72 . . . . . Quinazolines; Hydrogenated quinazolines
- C07D 239/74 . . . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to ring carbon atoms of the hetero ring
- C07D 239/76 . . . . . N-oxides
- C07D 239/78 . . . . . with hetero atoms directly attached in position 2
- C07D 239/80 . . . . . Oxygen atoms
- C07D 239/82 . . . . . with an aryl radical attached in position 4
- C07D 239/84 . . . . . Nitrogen atoms
- C07D 239/86 . . . . . with hetero atoms directly attached in position 4
- C07D 239/88 . . . . . Oxygen atoms
- C07D 239/90 . . . . . with acyclic radicals attached in positions 2 or 3
- C07D 239/91 . . . . . with aryl or aralkyl radicals attached in positions 2 or 3
- C07D 239/92 . . . . . with hetero atoms directly attached to nitrogen atoms of the hetero ring
- C07D 239/93 . . . . . Sulfur atoms
- C07D 239/94 . . . . . Nitrogen atoms
- C07D 239/95 . . . . . with hetero atoms directly attached in position 2 and 4
- C07D 239/96 . . . . . Two oxygen atoms

**C07D 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](#)

- C07D 241/02 . . . . . not condensed with other rings
- C07D 241/04 . . . . . having no double bonds between ring members or between ring members and non-ring members

- C07D 241/06
  - • having one or two double bonds between ring members or between ring members and non-ring members
- C07D 241/08
  - • • with oxygen atoms directly attached to ring carbon atoms
- C07D 241/10
  - • having three double bonds between ring members or between ring members and non-ring members
- C07D 241/12
  - • • with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 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
- C07D 241/16
  - • • • Halogen atoms; Nitro radicals
- C07D 241/18
  - • • • Oxygen or sulfur atoms
- C07D 241/20
  - • • • Nitrogen atoms ([nitro radicals C07D 241/16](#))
- C07D 241/22
  - • • • • Benzenesulfonamido pyrazines
- C07D 241/24
  - • • • Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- C07D 241/26
  - • • • • with nitrogen atoms directly attached to ring carbon atoms
- C07D 241/28
  - • • • • • in which said hetero-bound carbon atoms have double bonds to oxygen, sulfur or nitrogen atoms
- C07D 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
- C07D 241/32
  - • • • • • • • (Amino-pyrazinoyl) guanidines
- C07D 241/34
  - • • • • • • • (Amino-pyrazine carbonamido) guanidines [2,5]
- C07D 241/36
  - condensed with carbocyclic rings or ring systems
- C07D 241/38
  - • with only hydrogen or carbon atoms directly attached to the ring nitrogen atoms
- C07D 241/40
  - • • Benzopyrazines
- C07D 241/42
  - • • • with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the hetero ring
- C07D 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
- C07D 241/46
  - • • Phenazines
- C07D 241/48
  - • • • with hydrocarbon radicals, substituted by nitrogen atoms, directly attached to the ring nitrogen atoms
- C07D 241/50
  - • with hetero atoms directly attached to ring nitrogen atoms
- C07D 241/52
  - • • Oxygen atoms
- C07D 241/54
  - • • Nitrogen atoms
- C07D 243/00**
  - Heterocyclic compounds containing seven-membered rings having two nitrogen atoms as the only ring hetero atoms**
- C07D 243/02
  - having the nitrogen atoms in positions 1,2
- C07D 243/04
  - having the nitrogen atoms in positions 1,3
- C07D 243/06
  - having the nitrogen atoms in positions 1,4

- C07D 243/08
  - . . not condensed with other rings
- C07D 243/10
  - . . condensed with carbocyclic rings or ring systems
- C07D 243/12
  - . . . 1,5-Benzodiazepines; Hydrogenated 1,5-benzodiazepines
- C07D 243/14
  - . . . 1,4-Benzodiazepines; Hydrogenated 1,4-benzodiazepines
- C07D 243/16
  - . . . . substituted in position 5 by aryl radicals
- C07D 243/18
  - . . . . . substituted in position 2 by nitrogen, oxygen or sulfur atoms
- C07D 243/20
  - . . . . . Nitrogen atoms
- C07D 243/22
  - . . . . . Sulfur atoms
- C07D 243/24
  - . . . . . Oxygen atoms
- C07D 243/26
  - . . . . . Preparation from compounds already containing the benzodiazepine skeleton
- C07D 243/28
  - . . . . . Preparation including building-up the benzodiazepine skeleton from compounds containing no hetero rings
- C07D 243/30
  - . . . . . Preparation including building-up the benzodiazepine skeleton from compounds already containing hetero rings
- C07D 243/32
  - . . . . . containing a phthalimide or hydrogenated phthalimide ring system
- C07D 243/34
  - . . . . . containing a quinazoline or hydrogenated quinazoline ring system
- C07D 243/36
  - . . . . . containing an indole or hydrogenated indole ring system
- C07D 243/38
  - . . . [b, e]- or [b, f]-condensed with six-membered rings

**C07D 245/00 Heterocyclic compounds containing rings of more than seven members having two nitrogen atoms as the only ring hetero atoms**

- C07D 245/02
  - . not condensed with other rings
- C07D 245/04
  - . condensed with carbocyclic rings or ring systems
- C07D 245/06
  - . . condensed with one six-membered ring

**C07D 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](#) to [C07D 245/00](#)**

- C07D 247/02
  - . having the nitrogen atoms in positions 1 and 3

**C07D 249/00 Heterocyclic compounds containing five-membered rings having three nitrogen atoms as the only ring hetero atoms**

- C07D 249/02
  - . not condensed with other rings
- C07D 249/04
  - . . 1,2,3-Triazoles; Hydrogenated 1,2,3-triazoles
- C07D 249/06
  - . . . with aryl radicals directly attached to ring atoms
- C07D 249/08
  - . . 1,2,4-Triazoles; Hydrogenated 1,2,4-triazoles
- C07D 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
- C07D 249/12
  - . . . . Oxygen or sulfur atoms
- C07D 249/14
  - . . . . Nitrogen atoms

- C07D 249/16
  - condensed with carbocyclic rings or ring systems
- C07D 249/18
  - • Benzotriazoles
- C07D 249/20
  - • • with aryl radicals directly attached in position 2
- C07D 249/22
  - • Naphthotriazoles
- C07D 249/24
  - • • with stilbene radicals attached in position 2
- C07D 251/00 Heterocyclic compounds containing 1,3,5-triazine rings**
- C07D 251/02
  - not condensed with other rings
- C07D 251/04
  - • having no double bonds between ring members or between ring members and non-ring members
- C07D 251/06
  - • • with hetero atoms directly attached to ring nitrogen atoms
- C07D 251/08
  - • having one double bond between ring members or between a ring member and a non-ring member
- C07D 251/10
  - • having two double bonds between ring members or between ring members and non-ring members
- C07D 251/12
  - • having three double bonds between ring members or between ring members and non-ring members
- C07D 251/14
  - • • with hydrogen or carbon atoms directly attached to at least one ring carbon atom
- C07D 251/16
  - • • • to only one ring carbon atom
- C07D 251/18
  - • • • • with nitrogen atoms directly attached to the two other ring carbon atoms, e.g. guanamines
- C07D 251/20
  - • • • • with no nitrogen atoms directly attached to a ring carbon atom
- C07D 251/22
  - • • • to two ring carbon atoms
- C07D 251/24
  - • • • to three ring carbon atoms
- C07D 251/26
  - • • with only hetero atoms directly attached to ring carbon atoms
- C07D 251/28
  - • • • Only halogen atoms, e.g. cyanuric chloride
- C07D 251/30
  - • • • Only oxygen atoms
- C07D 251/32
  - • • • • Cyanuric acid; Isocyanuric acid
- C07D 251/34
  - • • • • Cyanuric or isocyanuric esters
- C07D 251/36
  - • • • • having halogen atoms directly attached to ring nitrogen atoms
- C07D 251/38
  - • • • Sulfur atoms
- C07D 251/40
  - • • • Nitrogen atoms
- C07D 251/42
  - • • • • One nitrogen atom
- C07D 251/44
  - • • • • • with halogen atoms attached to the two other ring carbon atoms
- C07D 251/46
  - • • • • • with oxygen or sulfur atoms attached to the two other ring carbon atoms
- C07D 251/48
  - • • • • Two nitrogen atoms
- C07D 251/50
  - • • • • • with a halogen atom attached to the third ring carbon atom
- C07D 251/52
  - • • • • • with an oxygen or sulfur atom attached to the third ring carbon atom
- C07D 251/54
  - • • • • Three nitrogen atoms
- C07D 251/56
  - • • • • • Preparation of melamine



- C07D 251/58 . . . . . from cyanamide, dicyanamide or calcium cyanamide
- C07D 251/60 . . . . . from urea or from carbon dioxide and ammonia
- C07D 251/62 . . . . . Purification of melamine
- C07D 251/64 . . . . . Condensation products of melamine with aldehydes;  
Derivatives thereof ([polycondensation products C08G](#))
- C07D 251/66 . . . . . Derivatives of melamine in which a hetero atom is directly  
attached to a nitrogen atom of melamine
- C07D 251/68 . . . . . Triazinylamino stilbenes
- C07D 251/70 . . . . . Other substituted melamines
- C07D 251/72 . . . . . condensed with carbocyclic rings or ring systems
  
- C07D 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](#)**
- C07D 253/02 . . . . . not condensed with other rings
- C07D 253/04 . . . . . 1,2,3-Triazines
- C07D 253/06 . . . . . 1,2,4-Triazines
- C07D 253/065 . . . . . having three double bonds between ring members or between ring  
members and non-ring members
- C07D 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
- C07D 253/075 . . . . . Two hetero atoms, in positions 3 and 5
- C07D 253/08 . . . . . condensed with carbocyclic rings or ring systems
- C07D 253/10 . . . . . Condensed 1, 2,4-triazines; Hydrogenated condensed 1,2,4-triazines
  
- C07D 255/00** **Heterocyclic compounds containing rings having three nitrogen atoms  
as the only ring hetero atoms, not provided for by groups [C07D 249/00](#) to  
[C07D 253/00](#)**
- C07D 255/02 . . . . . not condensed with other rings
- C07D 255/04 . . . . . condensed with carbocyclic rings or ring systems
  
- C07D 257/00** **Heterocyclic compounds containing rings having four nitrogen atoms as the  
only ring hetero atoms**
- C07D 257/02 . . . . . not condensed with other rings
- C07D 257/04 . . . . . Five-membered rings
- C07D 257/06 . . . . . with nitrogen atoms directly attached to the ring carbon atom
- C07D 257/08 . . . . . Six-membered rings
- C07D 257/10 . . . . . condensed with carbocyclic rings or ring systems
- C07D 257/12 . . . . . Six-membered rings having four nitrogen atoms
  
- C07D 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**

<b>C07D 261/00</b>	<b>Heterocyclic compounds containing 1,2-oxazole or hydrogenated 1,2-oxazole rings</b>
C07D 261/02	<ul style="list-style-type: none"> <li>not condensed with other rings</li> </ul>
C07D 261/04	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>having one double bond between ring members or between a ring member and a non-ring member</li> </ul> </li> </ul>
C07D 261/06	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>having two or more double bonds between ring members or between ring members and non-ring members</li> </ul> </li> </ul>
C07D 261/08	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms</li> </ul> </li> </ul> </li> </ul>
C07D 261/10	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>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</li> </ul> </li> </ul> </li> </ul>
C07D 261/12	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Oxygen atoms</li> </ul> </li> </ul> </li> </ul>
C07D 261/14	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Nitrogen atoms</li> </ul> </li> </ul> </li> </ul>
C07D 261/16	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Benzene-sulphonamido isoxazoles</li> </ul> </li> </ul> </li> </ul>
C07D 261/18	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen</li> </ul> </li> </ul> </li> </ul>
C07D 261/20	<ul style="list-style-type: none"> <li>condensed with carbocyclic rings or ring systems</li> </ul>
<b>C07D 263/00</b>	<b>Heterocyclic compounds containing 1,3-oxazole or hydrogenated 1,3-oxazole rings</b>
C07D 263/02	<ul style="list-style-type: none"> <li>not condensed with other rings</li> </ul>
C07D 263/04	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>having no double bonds between ring members or between ring members and non-ring members</li> </ul> </li> </ul>
C07D 263/06	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>with hydrocarbon radicals, substituted by oxygen atoms, attached to ring carbon atoms</li> </ul> </li> </ul> </li> </ul>
C07D 263/08	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>having one double bond between ring members or between a ring member and a non-ring member</li> </ul> </li> </ul>
C07D 263/10	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms</li> </ul> </li> </ul> </li> </ul>
C07D 263/12	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>with radicals containing only hydrogen and carbon atoms</li> </ul> </li> </ul> </li> </ul>
C07D 263/14	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>with radicals substituted by oxygen atoms</li> </ul> </li> </ul> </li> </ul>
C07D 263/16	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>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</li> </ul> </li> </ul> </li> </ul>
C07D 263/18	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Oxygen atoms</li> </ul> </li> </ul> </li> </ul>
C07D 263/20	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>attached in position 2</li> </ul> </li> </ul> </li> </ul> </li> </ul>
C07D 263/22	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to other ring carbon atoms</li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul>
C07D 263/24	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>with hydrocarbon radicals, substituted by oxygen atoms, attached to other ring carbon atoms</li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul>

- C07D 263/26 . . . . . with hetero atoms or acyl radicals directly attached to the ring nitrogen atom
- C07D 263/28 . . . . Nitrogen atoms not forming part of a nitro radical
- C07D 263/30 . . having two or three double bonds between ring members or between ring members and non-ring members
- C07D 263/32 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 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
- C07D 263/36 . . . . One oxygen atom
- C07D 263/38 . . . . . attached in position 2
- C07D 263/40 . . . . . attached in position 4
- C07D 263/42 . . . . . attached in position 5
- C07D 263/44 . . . . Two oxygen atoms
- C07D 263/46 . . . . Sulfur atoms
- C07D 263/48 . . . . Nitrogen atoms not forming part of a nitro radical
- C07D 263/50 . . . . . Benzene-sulphonamido oxazoles
- C07D 263/52 . condensed with carbocyclic rings or ring systems
- C07D 263/54 . . Benzoxazoles; Hydrogenated benzoxazoles
- C07D 263/56 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached in position 2
- C07D 263/57 . . . . Aryl or substituted aryl radicals
- C07D 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
- C07D 263/60 . . Naphthoxazoles; Hydrogenated naphthoxazoles
- C07D 263/62 . . having two or more ring systems containing condensed 1,3-oxazole rings
- C07D 263/64 . . . linked in positions 2 and 2' by chains containing six-membered aromatic rings or ring systems containing such rings

**C07D 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](#)

- C07D 265/02 . 1,2-Oxazines; Hydrogenated 1,2-oxazines
- C07D 265/04 . 1,3-Oxazines; Hydrogenated 1,3-oxazines
- C07D 265/06 . . not condensed with other rings
- C07D 265/08 . . . having one double bond between ring members or between a ring member and a non-ring member
- C07D 265/10 . . . . with oxygen atoms directly attached to ring carbon atoms
- C07D 265/12 . . condensed with carbocyclic rings or ring systems

- C07D 265/14 . . . condensed with one six-membered ring
- C07D 265/16 . . . . with only hydrogen or carbon atoms directly attached in positions 2 and 4
- C07D 265/18 . . . . with hetero atoms directly attached in position 2
- C07D 265/20 . . . . with hetero atoms directly attached in position 4
- C07D 265/22 . . . . . Oxygen atoms
- C07D 265/24 . . . . with hetero atoms directly attached in positions 2 and 4
- C07D 265/26 . . . . . Two oxygen atoms, e.g. isatoic anhydride
- C07D 265/28 . . . . . 1,4-Oxazines; Hydrogenated 1,4-oxazines
- C07D 265/30 . . . not condensed with other rings
- C07D 265/32 . . . . with oxygen atoms directly attached to ring carbon atoms
- C07D 265/33 . . . . . Two oxygen atoms, in positions 3 and 5
- C07D 265/34 . . . condensed with carbocyclic rings
- C07D 265/36 . . . . condensed with one six-membered ring
- C07D 265/38 . . . . [b, e]-condensed with two six-membered rings

**C07D 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**

- C07D 267/02 . Seven-membered rings
- C07D 267/04 . . having the hetero atoms in positions 1 and 2
- C07D 267/06 . . having the hetero atoms in positions 1 and 3
- C07D 267/08 . . having the hetero atoms in positions 1 and 4
- C07D 267/10 . . . not condensed with other rings
- C07D 267/12 . . . condensed with carbocyclic rings or ring systems
- C07D 267/14 . . . . condensed with one six-membered ring
- C07D 267/16 . . . . condensed with two six-membered rings
- C07D 267/18 . . . . . [b, e]-condensed
- C07D 267/20 . . . . . [b, f]-condensed
- C07D 267/22 . Eight-membered rings

**C07D 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](#) to [C07D 267/00](#)**

- C07D 269/02 . having the hetero atoms in positions 1 and 3

**C07D 271/00 Heterocyclic compounds containing five-membered rings having two nitrogen atoms and one oxygen atom as the only ring hetero atoms**

- C07D 271/02 . not condensed with other rings
- C07D 271/04 . . 1,2,3-Oxadiazoles; Hydrogenated 1,2,3-oxadiazoles
- C07D 271/06 . . 1,2,4-Oxadiazoles; Hydrogenated 1,2,4-oxadiazoles
- C07D 271/07 . . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical
- C07D 271/08 . . 1,2,5-Oxadiazoles; Hydrogenated 1,2,5-oxadiazoles

- C07D 271/10
  - 1,3,4-Oxadiazoles; Hydrogenated 1,3,4-oxadiazoles
- C07D 271/107
  - with two aryl or substituted aryl radicals attached in positions 2 and 5
- C07D 271/113
  - with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical
- C07D 271/12
  - condensed with carbocyclic rings or ring systems

**C07D 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](#) to [C07D 271/00](#)**

- C07D 273/01
  - having one nitrogen atom
- C07D 273/02
  - having two nitrogen atoms and only one oxygen atom
- C07D 273/04
  - Six-membered rings
- C07D 273/06
  - Seven-membered rings
- C07D 273/08
  - having two nitrogen atoms and more than one oxygen atom

**Heterocyclic compounds having nitrogen and sulfur as the only ring hetero atoms**

**C07D 275/00 Heterocyclic compounds containing 1,2-thiazole or hydrogenated 1,2-thiazole rings**

- C07D 275/02
  - not condensed with other rings
- C07D 275/03
  - 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
- C07D 275/04
  - condensed with carbocyclic rings or ring systems
- C07D 275/06
  - with hetero atoms directly attached to the ring sulfur atom

**C07D 277/00 Heterocyclic compounds containing 1,3-thiazole or hydrogenated 1,3-thiazole rings**

- C07D 277/02
  - not condensed with other rings
- C07D 277/04
  - having no double bonds between ring members or between ring members and non-ring members
- C07D 277/06
  - 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
- C07D 277/08
  - having one double bond between ring members or between a ring member and a non-ring member
- C07D 277/10
  - with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 277/12
  - 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
- C07D 277/14
  - Oxygen atoms
- C07D 277/16
  - Sulfur atoms
- C07D 277/18
  - Nitrogen atoms

- C07D 277/20 . . . having two or three double bonds between ring members or between ring members and non-ring members
- C07D 277/22 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 277/24 . . . Radicals substituted by oxygen atoms
- C07D 277/26 . . . Radicals substituted by sulfur atoms
- C07D 277/28 . . . Radicals substituted by nitrogen atoms
- C07D 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
- C07D 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
- C07D 277/34 . . . Oxygen atoms
- C07D 277/36 . . . Sulfur atoms
- C07D 277/38 . . . Nitrogen atoms
- C07D 277/40 . . . Unsubstituted amino or imino radicals
- C07D 277/42 . . . Amino or imino radicals substituted by hydrocarbon or substituted hydrocarbon radicals
- C07D 277/44 . . . Acylated amino or imino radicals
- C07D 277/46 . . . by carboxylic acids, or sulfur or nitrogen analogues thereof
- C07D 277/48 . . . by radicals derived from carbonic acid, or sulfur or nitrogen analogues thereof, e.g. carbonylguanidines
- C07D 277/50 . . . Nitrogen atoms bound to hetero atoms ([nitro radicals C07D 277/58](#))
- C07D 277/52 . . . to sulfur atoms, e.g. sulfonamides
- C07D 277/54 . . . Nitrogen and either oxygen or sulfur atoms
- C07D 277/56 . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- C07D 277/58 . . . Nitro radicals
- C07D 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.
 

$$\begin{array}{c} \text{---N} \\ | \\ \text{+} \text{---} \text{C} \text{---} (\text{CH}_2)_m \text{---} \text{C} \equiv \\ | \quad | \\ \text{S} \quad \text{Z} \end{array}$$

 with m >= 0, Z being a singly or a doubly bound hetero atom
- C07D 277/593 . . . Z being doubly bound oxygen or doubly bound nitrogen, which nitrogen is part of a possibly substituted oximino radical
- C07D 277/60 . . . condensed with carbocyclic rings or ring-systems
- C07D 277/62 . . . Benzothiazoles
- C07D 277/64 . . . with only hydrocarbon or substituted hydrocarbon radicals attached in position 2
- C07D 277/66 . . . with aromatic rings or ring systems directly attached in position 2

- C07D 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
- C07D 277/70 . . . . Sulfur atoms
- C07D 277/72 . . . . . 2-Mercaptobenzothiazole
- C07D 277/74 . . . . . Sulfur atoms substituted by carbon atoms
- C07D 277/76 . . . . . Sulfur atoms attached to a second hetero atom
- C07D 277/78 . . . . . . to a sulfur atom
- C07D 277/80 . . . . . . to a nitrogen atom
- C07D 277/82 . . . . Nitrogen atoms
- C07D 277/84 . . Naphthothiazoles

**C07D 279/00 Heterocyclic compounds containing six-membered rings having one nitrogen atom and one sulfur atom as the only ring hetero atoms**

**NOTE**

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

- C07D 279/02 . 1,2-Thiazines; Hydrogenated 1,2-thiazines
- C07D 279/04 . 1,3-Thiazines; Hydrogenated 1,3-thiazines
- C07D 279/06 . . not condensed with other rings
- C07D 279/08 . . condensed with carbocyclic rings or ring systems
- C07D 279/10 . 1,4-Thiazines; Hydrogenated 1,4-thiazines
- C07D 279/12 . . not condensed with other rings
- C07D 279/14 . . condensed with carbocyclic rings or ring systems
- C07D 279/16 . . . condensed with one six-membered ring
- C07D 279/18 . . . [b, e]-condensed with two six-membered rings
- C07D 279/20 . . . . with hydrogen atoms directly attached to the ring nitrogen atom
- C07D 279/22 . . . . with carbon atoms directly attached to the ring nitrogen atom
- C07D 279/24 . . . . . with hydrocarbon radicals, substituted by amino radicals, attached to the ring nitrogen atom
- C07D 279/26 . . . . . without other substituents attached to the ring system
- C07D 279/28 . . . . . with other substituents attached to the ring system
- C07D 279/30 . . . . . with acyl radicals attached to the ring nitrogen atom
- C07D 279/32 . . . . with hetero atoms directly attached to the ring nitrogen atom
- C07D 279/34 . . . . with hetero atoms directly attached to the ring sulfur atom
- C07D 279/36 . . . [b, e]-condensed, at least one with a further condensed benzene ring

**C07D 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**

- C07D 281/02 . Seven-membered rings
- C07D 281/04 . . having the hetero atoms in positions 1 and 4
- C07D 281/06 . . . not condensed with other rings



- C07D 281/08 . . . condensed with carbocyclic rings or ring systems
- C07D 281/10 . . . . condensed with one six-membered ring
- C07D 281/12 . . . . condensed with two six-membered rings
- C07D 281/14 . . . . . [b, e]-condensed
- C07D 281/16 . . . . . [b, f]-condensed
- C07D 281/18 . Eight-membered rings
  
- C07D 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](#) to [C07D 281/00](#)**
- C07D 283/02 . having the hetero atoms in positions 1 and 3
  
- C07D 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](#) to [C07D 283/00](#)**
- C07D 285/01 . Five-membered rings
- C07D 285/02 . . Thiadiazoles; Hydrogenated thiadiazoles
- C07D 285/04 . . . not condensed with other rings
- C07D 285/06 . . . . 1,2,3-Thiadiazoles; Hydrogenated 1,2,3-thiadiazoles
- C07D 285/08 . . . . 1,2,4-Thiadiazoles; Hydrogenated 1,2,4-thiadiazoles
- C07D 285/10 . . . . 1,2,5-Thiadiazoles; Hydrogenated 1,2,5-thiadiazoles
- C07D 285/12 . . . . 1,3,4-Thiadiazoles; Hydrogenated 1,3,4-thiadiazoles
- C07D 285/125 . . . . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical
- C07D 285/13 . . . . . Oxygen atoms
- C07D 285/135 . . . . . Nitrogen atoms
- C07D 285/14 . . . condensed with carbocyclic rings or ring systems
- C07D 285/15 . Six-membered rings
- C07D 285/16 . . Thiadiazines; Hydrogenated thiadiazines
- C07D 285/18 . . . 1,2,4-Thiadiazines; Hydrogenated 1,2,4-thiadiazines
- C07D 285/20 . . . . condensed with carbocyclic rings or ring systems
- C07D 285/22 . . . . . condensed with one six-membered ring
- C07D 285/24 . . . . . with oxygen atoms directly attached to the ring sulfur atom
- C07D 285/26 . . . . . substituted in position 6 or 7 by sulfamoyl or substituted sulfamoyl radicals
- C07D 285/28 . . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached in position 3
- C07D 285/30 . . . . . with hydrocarbon radicals, substituted by hetero atoms attached in position 3
- C07D 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

- C07D 285/34 . . . 1,3,5-Thiadiazines; Hydrogenated 1,3,5-thiadiazines
- C07D 285/36 . Seven-membered rings
- C07D 285/38 . Eight-membered rings

**C07D 291/00 Heterocyclic compounds containing rings having nitrogen, oxygen and sulfur atoms as the only ring hetero atoms**

- C07D 291/02 . not condensed with other rings
- C07D 291/04 . . Five-membered rings
- C07D 291/06 . . Six-membered rings
- C07D 291/08 . condensed with carbocyclic rings or ring systems

**C07D 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**

- C07D 293/02 . not condensed with other rings
- C07D 293/04 . . Five-membered rings
- C07D 293/06 . . . Selenazoles; Hydrogenated selenazoles
- C07D 293/08 . . Six-membered rings
- C07D 293/10 . condensed with carbocyclic rings or ring systems
- C07D 293/12 . . Selenazoles; Hydrogenated selenazoles

**C07D 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**

- C07D 295/02 . containing only hydrogen and carbon atoms in addition to the ring hetero elements
- C07D 295/023 . . Preparation; Separation; Stabilisation; Use of additives
- C07D 295/027 . . containing only one hetero ring
- C07D 295/03 . . . with the ring nitrogen atoms directly attached to acyclic carbon atoms
- C07D 295/033 . . . with the ring nitrogen atoms directly attached to carbocyclic rings
- C07D 295/037 . . with quaternary ring nitrogen atoms
- C07D 295/04 . with substituted hydrocarbon radicals attached to ring nitrogen atoms
- C07D 295/06 . . substituted by halogen atoms or nitro radicals
- C07D 295/067 . . . with the ring nitrogen atoms and the substituents attached to the same carbon chain, which is not interrupted by carbocyclic rings
- C07D 295/073 . . . with the ring nitrogen atoms and the substituents separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- C07D 295/08 . . substituted by singly bound oxygen or sulfur atoms
- C07D 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
- C07D 295/088 . . . . to an acyclic saturated chain
- C07D 295/092 . . . . with aromatic radicals attached to the chain

- C07D 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
- C07D 295/10
  - . . substituted by doubly bound oxygen or sulfur atoms ([acylated ring nitrogen atoms C07D 295/16](#))
- C07D 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
- C07D 295/108
  - . . . . to an acyclic saturated chain
- C07D 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
- C07D 295/116
  - . . . . with the doubly bound oxygen or sulfur atoms directly attached to a carbocyclic ring
- C07D 295/12
  - . . substituted by singly or doubly bound nitrogen atoms ([nitro radicals C07D 295/06](#))
- C07D 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
- C07D 295/13
  - . . . . to an acyclic saturated chain
- C07D 295/135
  - . . . with the ring nitrogen atoms and the substituent nitrogen atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- C07D 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
- C07D 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
- C07D 295/15
  - . . . . to an acyclic saturated chain
- C07D 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
- C07D 295/16
  - . acylated on ring nitrogen atoms
- C07D 295/18
  - . . by radicals derived from carboxylic acids, or sulfur or nitrogen analogues thereof
- C07D 295/182
  - . . . Radicals derived from carboxylic acids
- C07D 295/185
  - . . . . from aliphatic carboxylic acids
- C07D 295/192
  - . . . . from aromatic carboxylic acids
- C07D 295/194
  - . . . Radicals derived from thio- or thiono carboxylic acids
- C07D 295/195
  - . . . Radicals derived from nitrogen analogues of carboxylic acids
- C07D 295/20
  - . . by radicals derived from carbonic acid, or sulfur or nitrogen analogues thereof
- C07D 295/205
  - . . . Radicals derived from carbonic acid
- C07D 295/21
  - . . . Radicals derived from sulfur analogues of carbonic acid
- C07D 295/215
  - . . . Radicals derived from nitrogen analogues of carbonic acid
- C07D 295/22
  - . with hetero atoms directly attached to ring nitrogen atoms
- C07D 295/24
  - . . Oxygen atoms

- C07D 295/26 . . Sulfur atoms
- C07D 295/28 . . Nitrogen atoms
- C07D 295/30 . . . non-acylated
- C07D 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**

**C07D 301/00**

**Preparation of oxiranes**

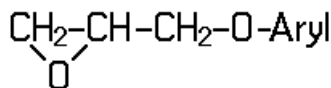
- C07D 301/02 . Synthesis of the oxirane ring
- C07D 301/03 . . by oxidation of unsaturated compounds, or of mixtures of unsaturated and saturated compounds
- C07D 301/04 . . . with air or molecular oxygen
- C07D 301/06 . . . . in the liquid phase
- C07D 301/08 . . . . in the gaseous phase
- C07D 301/10 . . . . . with catalysts containing silver or gold
- C07D 301/12 . . . with hydrogen peroxide or inorganic peroxides or peracids
- C07D 301/14 . . . with organic peracids, or salts, anhydrides or esters thereof
- C07D 301/16 . . . . formed in situ e.g. from carboxylic acids and hydrogen peroxide
- C07D 301/18 . . . . . from polybasic carboxylic acids
- C07D 301/19 . . . with organic hydroperoxides
- C07D 301/22 . . by oxidation of the saturated compounds with air or molecular oxygen (of mixtures of unsaturated compounds [C07D 301/04](#))
- C07D 301/24 . . by splitting off HAL-Y from compounds containing the radical HAL-C-C-OY
- C07D 301/26 . . . Y being hydrogen
- C07D 301/27 . Condensation of epihalohydrins or halohydrins with compounds containing active hydrogen atoms ([macromolecular compounds C08](#))
- C07D 301/28 . . by reaction with hydroxyl radicals
- C07D 301/30 . . by reaction with carboxyl radicals
- C07D 301/32 . Separation; Purification
- C07D 301/36 . Use of additives, e.g. for stabilisation

**C07D 303/00**

**Compounds containing three-membered rings having one oxygen atom as the only ring heteroatom**

- C07D 303/02 . Compounds containing oxirane rings
- C07D 303/04 . . containing only hydrogen and carbon atoms in addition to the ring oxygen atoms
- C07D 303/06 . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings
- C07D 303/08 . . with hydrocarbon radicals, substituted by halogen atoms, nitro radicals or nitroso radicals

- C07D 303/10 . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings ([steroids C07J](#))
- C07D 303/12 . . with hydrocarbon radicals substituted by singly or doubly bound oxygen atoms
- C07D 303/14 . . . by free hydroxyl radicals
- C07D 303/16 . . . by esterified hydroxyl radicals
- C07D 303/17 . . . . containing oxirane rings condensed with carbocyclic ring systems having three or more relevant rings
- C07D 303/18 . . . by etherified hydroxyl radicals
- C07D 303/20 . . . . Ethers with hydroxy compounds containing no oxirane rings
- C07D 303/22 . . . . . with monohydroxy compounds
- C07D 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.



- C07D 303/24 . . . . . with polyhydroxy compounds
- C07D 303/26 . . . . . having one or more free hydroxyl radicals
- C07D 303/27 . . . . . having all hydroxyl radicals etherified with oxirane containing compounds
- C07D 303/28 . . . . Ethers with hydroxy compounds containing oxirane rings
- C07D 303/30 . . . . . ethers of oxirane-containing polyhydroxy compounds in which all hydroxyl radicals are etherified with oxirane-containing hydroxy compounds
- C07D 303/31 . . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings
- C07D 303/32 . . . by aldehydo- or ketonic radicals
- C07D 303/34 . . with hydrocarbon radicals substituted by sulfur, selenium or tellurium atoms
- C07D 303/36 . . with hydrocarbon radicals substituted by nitrogen atoms ([nitro, nitroso radicals C07D 303/08](#))
- C07D 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
- C07D 303/40 . . . by ester radicals
- C07D 303/42 . . . . Acyclic compounds having a chain of seven or more carbon atoms, e.g. epoxidised fats
- C07D 303/44 . . . . Esterified with oxirane-containing hydroxy compounds
- C07D 303/46 . . . by amide or nitrile radicals
- C07D 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
- C07D 305/00 Heterocyclic compounds containing four-membered rings having one oxygen atom as the only ring hetero atom**
- C07D 305/02 . not condensed with other rings

- C07D 305/04
  - • having no double bonds between ring members or between ring members and non-ring members
- C07D 305/06
  - • • with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring atoms
- C07D 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
- C07D 305/10
  - • having one or more double bonds between ring members or between ring members and non-ring members
- C07D 305/12
  - • • Beta-lactones
- C07D 305/14
  - condensed with carbocyclic rings or ring systems
- C07D 307/00 Heterocyclic compounds containing five-membered rings having one oxygen atom as the only ring hetero atom**
- C07D 307/02
  - not condensed with other rings
- C07D 307/04
  - • having no double bonds between ring members or between ring members and non-ring members
- C07D 307/06
  - • • with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- C07D 307/08
  - • • • Preparation of tetrahydrofuran
- C07D 307/10
  - • • with substituted hydrocarbon radicals attached to ring carbon atoms
- C07D 307/12
  - • • • Radicals substituted by oxygen atoms
- C07D 307/14
  - • • • Radicals substituted by nitrogen atoms not forming part of a nitro radical
- C07D 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
- C07D 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
- C07D 307/20
  - • • • Oxygen atoms
- C07D 307/22
  - • • • Nitrogen atoms not forming part of a nitro radical
- C07D 307/24
  - • • • Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- C07D 307/26
  - • having one double bond between ring members or between a ring member and a non-ring member
- C07D 307/28
  - • • with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 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
- C07D 307/32
  - • • • Oxygen atoms
- C07D 307/33
  - • • • • in position 2, the oxygen atom being in its keto or unsubstituted enol form
- C07D 307/34
  - • having two or three double bonds between ring members or between ring members and non-ring members

- C07D 307/36 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- C07D 307/38 . . . with substituted hydrocarbon radicals attached to ring carbon atoms
- C07D 307/40 . . . Radicals substituted by oxygen atoms
- C07D 307/42 . . . . Singly bound oxygen atoms ([two oxygen atoms bound to the same carbon atom C07D 307/46](#))
- C07D 307/44 . . . . Furfuryl alcohol
- C07D 307/45 . . . . Oxygen atoms acylated by a cyclopropane containing carboxylic acyl radical, e.g. chrysanthemumates
- C07D 307/46 . . . . Doubly bound oxygen atoms, or two oxygen atoms singly bound to the same carbon atom
- C07D 307/48 . . . . Furfural
- C07D 307/50 . . . . Preparation from natural products
- C07D 307/52 . . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
- C07D 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
- C07D 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
- C07D 307/58 . . . . One oxygen atom, e.g. butenolide
- C07D 307/60 . . . . Two oxygen atoms, e.g. succinic anhydride
- C07D 307/62 . . . . Three oxygen atoms, e.g. ascorbic acid
- C07D 307/64 . . . . Sulfur atoms
- C07D 307/66 . . . . Nitrogen atoms ([nitro radicals C07D 307/70](#))
- C07D 307/68 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- C07D 307/70 . . . . Nitro radicals
- C07D 307/71 . . . . attached in position 5
- C07D 307/72 . . . . with hydrocarbon radicals, substituted by nitrogen-containing radicals, attached in position 2
- C07D 307/73 . . . . by amino or imino, or substituted amino or imino radicals
- C07D 307/74 . . . . by hydrazino or hydrazono or such substituted radicals
- C07D 307/75 . . . . having carboxylic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. hydrazides
- C07D 307/76 . . . . having carbonic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. semicarbazides
- C07D 307/77 . . ortho- or peri-condensed with carbocyclic rings or ring systems
- C07D 307/78 . . Benzo [b] furans; Hydrogenated benzo [b] furans
- C07D 307/79 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals directly attached to carbon atoms of the hetero ring
- C07D 307/80 . . . . Radicals substituted by oxygen atoms



- C07D 307/81 . . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
- C07D 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
- C07D 307/83 . . . . Oxygen atoms
- C07D 307/84 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- C07D 307/85 . . . . . attached in position 2
- C07D 307/86 . . . with an oxygen atom directly attached in position 7
- C07D 307/87 . . Benzo [c] furans; Hydrogenated benzo [c] furans
- C07D 307/88 . . . with one oxygen atom directly attached in position 1 or 3
- C07D 307/885 . . . . 3,3-Diphenylphthalides
- C07D 307/89 . . . with two oxygen atoms directly attached in positions 1 and 3
- C07D 307/90 . . . with an oxygen atom in position 1 and a nitrogen atom in position 3, or vice-versa
- C07D 307/91 . . Dibenzofurans; Hydrogenated dibenzofurans
- C07D 307/92 . . Naphthofurans; Hydrogenated naphthofurans
- C07D 307/93 . . condensed with a ring other than six-membered
- C07D 307/935 . . . Not further condensed cyclopenta [b] furans or hydrogenated cyclopenta [b] furans
- C07D 307/937 . . . . with hydrocarbon or substituted hydrocarbon radicals directly attached in position 2, e.g. prostacyclins
- C07D 307/94 . spiro-condensed with carbocyclic rings or ring systems, e.g. griseofulvins
- C07D 309/00 Heterocyclic compounds containing six-membered rings having one oxygen atom as the only ring hetero atom, not condensed with other rings**
- C07D 309/02 . having no double bonds between ring members or between ring members and non-ring members
- C07D 309/04 . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- C07D 309/06 . . . Radicals substituted by oxygen atoms
- C07D 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
- C07D 309/10 . . . Oxygen atoms
- C07D 309/12 . . . . Only hydrogen atoms and one oxygen atom directly attached to ring carbon atoms, e.g. tetrahydropyranyl ethers
- C07D 309/14 . . . Nitrogen atoms not forming part of a nitro radical {(nitro radical [C07D 309/08](#))}
- C07D 309/16 . having one double bond between ring members or between a ring member and a non-ring member
- C07D 309/18 . . containing only hydrogen and carbon atoms in addition to the ring hetero atom

- C07D 309/20 . . with hydrogen atoms and substituted hydrocarbon radicals directly attached to ring carbon atoms
- C07D 309/22 . . . Radicals substituted by oxygen atoms
- C07D 309/24 . . . . Methylol radicals
- C07D 309/26 . . . . Carboxaldehyde radicals
- C07D 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
- C07D 309/30 . . . Oxygen atoms, e.g. delta-lactones
- C07D 309/32 . having two double bonds between ring members or between ring members and non-ring members
- C07D 309/34 . having three or more double bonds between ring members or between ring members and non-ring members
- C07D 309/36 . . with oxygen atoms directly attached to ring carbon atoms
- C07D 309/38 . . . One oxygen atom in position 2 or 4, e.g. pyrones
- C07D 309/40 . . . Oxygen atoms attached in position 3 and 4, e.g. maltol
- C07D 311/00 Heterocyclic compounds containing six-membered rings having one oxygen atom as the only hetero atom, condensed with other rings**
- C07D 311/02 . ortho- or peri-condensed with carbocyclic rings or ring systems
- C07D 311/04 . . Benzo[b]pyrans, not hydrogenated in the carbocyclic ring
- C07D 311/06 . . . with oxygen or sulfur atoms directly attached in position 2
- C07D 311/08 . . . . not hydrogenated in the hetero ring
- C07D 311/10 . . . . . unsubstituted
- C07D 311/12 . . . . . substituted in position 3 and unsubstituted in position 7
- C07D 311/14 . . . . . substituted in position 6 and unsubstituted in position 7
- C07D 311/16 . . . . . substituted in position 7
- C07D 311/18 . . . . . substituted otherwise than in position 3 or 7 ([substituted in position 4 by oxygen or sulfur C07D 311/42](#))
- C07D 311/20 . . . . hydrogenated in the hetero ring
- C07D 311/22 . . . with oxygen or sulfur atoms directly attached in position 4
- C07D 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
- C07D 311/26 . . . . with aromatic rings attached in position 2 or 3
- C07D 311/28 . . . . . with aromatic rings attached in position 2 only
- C07D 311/30 . . . . . not hydrogenated in the hetero ring, e.g. flavones
- C07D 311/32 . . . . . 2,3-Dihydro derivatives, e.g. flavanones
- C07D 311/34 . . . . . with aromatic rings attached in position 3 only
- C07D 311/36 . . . . . not hydrogenated in the hetero ring, e.g. isoflavones
- C07D 311/38 . . . . . 2,3-Dihydro derivated, e.g. isoflavanones
- C07D 311/40 . . . . . Separation, e.g. from natural material; Purification
- C07D 311/42 . . . with oxygen or sulfur atoms in position 2 and 4

- C07D 311/44 . . . . with one hydrogen atom in position 3
- C07D 311/46 . . . . . unsubstituted in the carbocyclic ring
- C07D 311/48 . . . . . with two such benzopyran radicals linked together by a carbon chain
- C07D 311/50 . . . . . with elements other than carbon and hydrogen in position 3
- C07D 311/52 . . . . . Enol-esters or -ethers, or sulfur analogues thereof
- C07D 311/54 . . . . . substituted in the carbocyclic ring
- C07D 311/56 . . . . without hydrogen atoms in position 3
- C07D 311/58 . . . other than with oxygen or sulfur atoms in positions 2 or 4
- C07D 311/60 . . . . with aryl radicals attached in position 2
- C07D 311/62 . . . . . with oxygen atoms directly attached in position 3 e.g. anthocyanidins
- C07D 311/64 . . . . with oxygen atoms directly attached in position 8
- C07D 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
- C07D 311/68 . . . . with nitrogen atoms directly attached in position 4
- C07D 311/70 . . . . with two hydrocarbon radicals attached in position 2 and elements other than carbon and hydrogen in position 6
- C07D 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
- C07D 311/74 . . Benzo[b]pyrans, hydrogenated in the carbocyclic ring
- C07D 311/76 . . Benzo[c]pyrans
- C07D 311/78 . . Ring systems having three or more relevant rings
- C07D 311/80 . . . Dibenzopyrans; Hydrogenated dibenzopyrans
- C07D 311/82 . . . . Xanthenes
- C07D 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
- C07D 311/86 . . . . . Oxygen atoms, e.g. xanthenes
- C07D 311/88 . . . . . Nitrogen atoms
- C07D 311/90 . . . . . with hydrocarbon radicals substituted by amino radicals, directly attached in position 9
- C07D 311/92 . . . Naphthopyrans; Hydrogenated naphthopyrans
- C07D 311/94 . . condensed with rings other than six-membered
- C07D 311/96 . spiro-condensed with carbocyclic rings or ring systems
- C07D 313/00 Heterocyclic compounds containing rings of more than six members having one oxygen atom as the only ring hetero atom**
- C07D 313/02 . Seven-membered rings
- C07D 313/04 . . not condensed with other rings
- C07D 313/06 . . condensed with carbocyclic rings or ring systems
- C07D 313/08 . . . condensed with one six-membered ring

- C07D 313/10 . . . condensed with two six-membered rings
- C07D 313/12 . . . . [b,e]-condensed
- C07D 313/14 . . . . [b,f]-condensed
- C07D 313/16 . Eight-membered rings
- C07D 313/18 . . not condensed with other rings
- C07D 313/20 . . condensed with carbocyclic rings or ring systems

**C07D 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](#) to [C07D 313/00](#)**

**C07D 317/00 Heterocyclic compounds containing five-membered rings having two oxygen atoms as the only ring hetero atoms**

- C07D 317/02 . having the hetero atoms in positions 1 and 2
- C07D 317/04 . . not condensed with other rings
- C07D 317/06 . . condensed with carbocyclic rings or ring systems
- C07D 317/08 . having the hetero atoms in positions 1 and 3
- C07D 317/10 . . not condensed with other rings
- C07D 317/12 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- C07D 317/14 . . . with substituted hydrocarbon radicals attached to ring carbon atoms
- C07D 317/16 . . . . Radicals substituted by halogen atoms or nitro radicals
- C07D 317/18 . . . . Radicals substituted by singly bound oxygen or sulfur atoms
- C07D 317/20 . . . . . Free hydroxyl or mercaptan
- C07D 317/22 . . . . . etherified
- C07D 317/24 . . . . . esterified
- C07D 317/26 . . . . Radicals substituted by doubly bound oxygen or sulfur atoms or by two such atoms singly bound to the same carbon atom
- C07D 317/28 . . . . Radicals substituted by nitrogen atoms ([by nitro radicals C07D 317/16](#))
- C07D 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
- C07D 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
- C07D 317/34 . . . . Oxygen atoms
- C07D 317/36 . . . . . Alkylene carbonates; Substituted alkylene carbonates
- C07D 317/38 . . . . . . Ethylene carbonate
- C07D 317/40 . . . . . Vinylene carbonate; Substituted vinylene carbonates
- C07D 317/42 . . . . Halogen atoms or nitro radicals
- C07D 317/44 . . ortho- or peri-condensed with carbocyclic rings or ring systems
- C07D 317/46 . . . condensed with one six-membered ring

- C07D 317/48 . . . . Methylenedioxybenzenes or hydrogenated methylenedioxybenzenes unsubstituted on the hetero ring
- C07D 317/50 . . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to atoms of the carbocyclic ring
- C07D 317/52 . . . . Radicals substituted by halogen atoms or nitro radicals
- C07D 317/54 . . . . Radicals substituted by oxygen atoms
- C07D 317/56 . . . . Radicals substituted by sulfur atoms
- C07D 317/58 . . . . Radicals substituted by nitrogen atoms (by nitro radicals [C07D 317/52](#))
- C07D 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
- C07D 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
- C07D 317/64 . . . . Oxygen atoms
- C07D 317/66 . . . . Nitrogen atoms not forming part of a nitro radical
- C07D 317/68 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- C07D 317/70 . . . condensed with ring systems containing two or more relevant rings
- C07D 317/72 . . spiro-condensed with carbocyclic rings
  
- C07D 319/00 Heterocyclic compounds containing six-membered rings having two oxygen atoms as the only ring hetero atoms**
- C07D 319/02 . 1,2-Dioxanes; Hydrogenated 1,2-dioxanes
- C07D 319/04 . 1,3-Dioxanes; Hydrogenated 1,3-dioxanes
- C07D 319/06 . . not condensed with other rings
- C07D 319/08 . . condensed with carbocyclic rings or ring systems
- C07D 319/10 . 1,4-Dioxanes; Hydrogenated 1,4-dioxanes
- C07D 319/12 . . not condensed with other rings
- C07D 319/14 . . condensed with carbocyclic rings or ring systems
- C07D 319/16 . . . condensed with one six-membered ring
- C07D 319/18 . . . . Ethylenedioxybenzenes, not substituted on the hetero ring
- C07D 319/20 . . . . with substituents attached to the hetero ring
- C07D 319/22 . . . condensed with one naphthalene or hydrogenated naphthalene ring system
- C07D 319/24 . . . [b,e]-condensed with two six-membered rings
  
- C07D 321/00 Heterocyclic compounds containing rings having two oxygen atoms as the only ring hetero atoms, not provided for by groups [C07D 317/00](#) to [C07D 319/00](#)**
- C07D 321/02 . Seven-membered rings
- C07D 321/04 . . not condensed with other rings
- C07D 321/06 . . . 1,3-Dioxepines; Hydrogenated 1,3-dioxepines

- C07D 321/08 . . . 1,4-Dioxepines; Hydrogenated 1,4-dioxepines
- C07D 321/10 . . condensed with carbocyclic rings or ring systems
- C07D 321/12 . Eight-membered rings
- C07D 323/00 Heterocyclic compounds containing more than two oxygen atoms as the only ring hetero atoms**
- C07D 323/02 . Five-membered rings
- C07D 323/04 . Six-membered rings
- C07D 323/06 . . trioxane
- C07D 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](#) to [C07D 323/00](#)**
- C07D 327/00 Heterocyclic compounds containing rings having oxygen and sulfur atoms as the only ring hetero atoms**
- C07D 327/02 . One oxygen atom and one sulfur atom
- C07D 327/04 . . Five-membered rings
- C07D 327/06 . . Six-membered rings
- C07D 327/08 . . . [b,e]-condensed with two six-membered carbocyclic rings
- C07D 327/10 . Two oxygen atoms and one sulfur atom, e.g. cyclic sulfates
- C07D 329/00 Heterocyclic compounds containing rings having oxygen and selenium or oxygen and tellurium atoms as the only ring hetero atoms**

**Heterocyclic compounds having sulfur, selenium or tellurium as the only ring hetero atoms**

- C07D 331/00 Heterocyclic compounds containing rings of less than five members, having one sulfur atom as the only ring hetero atom**
- C07D 331/02 . Three-membered rings
- C07D 331/04 . Four-membered rings
- C07D 333/00 Heterocyclic compounds containing five-membered rings having one sulfur atom as the only ring hetero atom**
- C07D 333/02 . not condensed with other rings
- C07D 333/04 . . not substituted on the ring sulfur
- C07D 333/06 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring carbon atoms
- C07D 333/08 . . . . Hydrogen atoms or radicals containing only hydrogen and carbon atoms
- C07D 333/10 . . . . . Thiophene
- C07D 333/12 . . . . Radicals substituted by halogen atoms or nitro or nitroso radicals
- C07D 333/14 . . . . Radicals substituted by singly bound hetero atoms other than halogen
- C07D 333/16 . . . . . by oxygen atoms
- C07D 333/18 . . . . . by sulfur atoms

- C07D 333/20 . . . . by nitrogen atoms ([nitro, nitroso radicals C07D 333/12](#))
- C07D 333/22 . . . . Radicals substituted by doubly bound hetero atoms, or by two hetero atoms other than halogen singly bound to the same carbon atom
- C07D 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
- C07D 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
- C07D 333/28 . . . . Halogen atoms
- C07D 333/30 . . . . Hetero atoms other than halogen
- C07D 333/32 . . . . . Oxygen atoms
- C07D 333/34 . . . . . Sulfur atoms
- C07D 333/36 . . . . . Nitrogen atoms ([nitro, nitroso radicals C07D 333/42](#))
- C07D 333/38 . . . . Carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals
- C07D 333/40 . . . . . Thiophene-2-carboxylic acid [2]
- C07D 333/42 . . . . with nitro or nitroso radicals directly attached to ring carbon atoms
- C07D 333/44 . . . . . attached in position 5
- C07D 333/46 . . substituted on the ring sulfur atom
- C07D 333/48 . . . by oxygen atoms
- C07D 333/50 . condensed with carbocyclic rings or ring systems
- C07D 333/52 . . Benzo[b]thiophenes; Hydrogenated benzo[b]thiophenes
- C07D 333/54 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the hetero ring
- C07D 333/56 . . . . Radicals substituted by oxygen atoms
- C07D 333/58 . . . . Radicals substituted by nitrogen atoms
- C07D 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
- C07D 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
- C07D 333/64 . . . . Oxygen atoms
- C07D 333/66 . . . . Nitrogen atoms not forming part of a nitro radical
- C07D 333/68 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- C07D 333/70 . . . . . attached in position 2
- C07D 333/72 . . Benzo[c]thiophenes; Hydrogenated benzo[c]thiophenes
- C07D 333/74 . . Naphthothiophenes
- C07D 333/76 . . Dibenzothiophenes
- C07D 333/78 . . condensed with rings other than six-membered or with ring systems containing such rings
- C07D 333/80 . . . Seven-membered rings



**C07D 335/00 Heterocyclic compounds containing six-membered rings having one sulfur atom as the only ring hetero atom**

- C07D 335/02 . not condensed with other rings
- C07D 335/04 . condensed with carbocyclic rings or ring systems
- C07D 335/06 . . Benzothiopyrans; Hydrogenated benzothiopyrans
- C07D 335/08 . . Naphthothiopyrans; Hydrogenated naphthothiopyrans
- C07D 335/10 . . Dibenzothiopyrans; Hydrogenated dibenzothiopyrans
- C07D 335/12 . . . Thioxanthenes
- C07D 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
- C07D 335/16 . . . . . Oxygen atoms, e.g. thioxanthenes
- C07D 335/18 . . . . . Nitrogen atoms
- C07D 335/20 . . . . with hydrocarbon radicals, substituted by amino radicals, directly attached in position 9

**C07D 337/00 Heterocyclic compounds containing rings of more than six members having one sulfur atom as the only ring hetero atom**

- C07D 337/02 . Seven-membered rings
- C07D 337/04 . . not condensed with other rings
- C07D 337/06 . . condensed with carbocyclic rings or ring systems
- C07D 337/08 . . . condensed with one six-membered ring
- C07D 337/10 . . . condensed with two six-membered rings
- C07D 337/12 . . . . [b,e]-condensed
- C07D 337/14 . . . . [b,f]-condensed
- C07D 337/16 . Eight-membered rings

**C07D 339/00 Heterocyclic compounds containing rings having two sulfur atoms as the only ring hetero atoms**

- C07D 339/02 . Five-membered rings
- C07D 339/04 . . having the hetero atoms in position 1,2, e.g. lipoic acid
- C07D 339/06 . . having the hetero atoms in position 1,3, e.g. cyclic dithiocarbonates
- C07D 339/08 . Six-membered rings

**C07D 341/00 Heterocyclic compounds containing rings having three or more sulfur atoms as the only ring hetero atoms**

**C07D 343/00 Heterocyclic compounds containing rings having sulfur and selenium or sulfur and tellurium atoms as the only ring hetero atoms**

**C07D 345/00 Heterocyclic compounds containing rings having selenium or tellurium atoms as the only ring hetero atoms**

**C07D 347/00 Heterocyclic compounds containing rings having halogen atoms as ring hetero atoms**

**Heterocyclic compounds containing two or more hetero rings**

**C07D 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**

- C07D 401/02      .    containing two hetero rings
- C07D 401/04      .    .    directly linked by a ring-member-to-ring-member bond
- C07D 401/06      .    .    linked by a carbon chain containing only aliphatic carbon atoms
- C07D 401/08      .    .    linked by a carbon chain containing alicyclic rings
- C07D 401/10      .    .    linked by a carbon chain containing aromatic rings
- C07D 401/12      .    .    linked by a chain containing hetero atoms as chain links
- C07D 401/14      .    containing three or more hetero rings

**C07D 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](#)**

- C07D 403/02      .    containing two hetero rings
- C07D 403/04      .    .    directly linked by a ring-member-to-ring-member bond
- C07D 403/06      .    .    linked by a carbon chain containing only aliphatic carbon atoms
- C07D 403/08      .    .    linked by a carbon chain containing alicyclic rings
- C07D 403/10      .    .    linked by a carbon chain containing aromatic rings
- C07D 403/12      .    .    linked by a chain containing hetero atoms as chain links
- C07D 403/14      .    containing three or more hetero rings

**C07D 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**

- C07D 405/02      .    containing two hetero rings
- C07D 405/04      .    .    directly linked by a ring-member-to-ring-member bond
- C07D 405/06      .    .    linked by a carbon chain containing only aliphatic carbon atoms
- C07D 405/08      .    .    linked by a carbon chain containing alicyclic rings
- C07D 405/10      .    .    linked by a carbon chain containing aromatic rings
- C07D 405/12      .    .    linked by a chain containing hetero atoms as chain links
- C07D 405/14      .    containing three or more hetero rings

**C07D 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](#)**

- C07D 407/02      .    containing two hetero rings
- C07D 407/04      .    .    directly linked by a ring-member-to-ring-member bond
- C07D 407/06      .    .    linked by a carbon chain containing only aliphatic carbon atoms
- C07D 407/08      .    .    linked by a carbon chain containing alicyclic rings
- C07D 407/10      .    .    linked by a carbon chain containing aromatic rings

- C07D 407/12
  - • linked by a chain containing hetero atoms as chain links
- C07D 407/14
  - containing three or more hetero rings

**C07D 409/00**      **Heterocyclic compounds containing two or more hetero rings, at least one ring having sulfur atoms as the only ring hetero atoms**

- C07D 409/02
  - containing two hetero rings
- C07D 409/04
  - • directly linked by a ring-member-to-ring-member bond
- C07D 409/06
  - • linked by a carbon chain containing only aliphatic carbon atoms
- C07D 409/08
  - • linked by a carbon chain containing alicyclic rings
- C07D 409/10
  - • linked by a carbon chain containing aromatic rings
- C07D 409/12
  - • linked by a chain containing hetero atoms as chain links
- C07D 409/14
  - containing three or more hetero rings

**C07D 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**

- C07D 411/02
  - containing two hetero rings
- C07D 411/04
  - • directly linked by a ring-member-to-ring-member bond
- C07D 411/06
  - • linked by a carbon chain containing only aliphatic carbon atoms
- C07D 411/08
  - • linked by a carbon chain containing alicyclic rings
- C07D 411/10
  - • linked by a carbon chain containing aromatic rings
- C07D 411/12
  - • linked by a chain containing hetero atoms as chain links
- C07D 411/14
  - containing three or more hetero rings

**C07D 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**

- C07D 413/02
  - containing two hetero rings
- C07D 413/04
  - • directly linked by a ring-member-to-ring-member bond
- C07D 413/06
  - • linked by a carbon chain containing only aliphatic carbon atoms
- C07D 413/08
  - • linked by a carbon chain containing alicyclic rings
- C07D 413/10
  - • linked by a carbon chain containing aromatic rings
- C07D 413/12
  - • linked by a chain containing hetero atoms as chain links
- C07D 413/14
  - containing three or more hetero rings

**C07D 415/00**      **Heterocyclic compounds containing the thiamine skeleton**

**C07D 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](#)**

- C07D 417/02
  - containing two hetero rings
- C07D 417/04
  - • directly linked by a ring-member-to-ring-member bond
- C07D 417/06
  - • linked by a carbon chain containing only aliphatic carbon atoms
- C07D 417/08
  - • linked by a carbon chain containing alicyclic rings
- C07D 417/10
  - • linked by a carbon chain containing aromatic rings

- C07D 417/12 . . linked by a chain containing hetero atoms as chain links
- C07D 417/14 . containing three or more hetero rings

**C07D 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**

- C07D 419/02 . containing two hetero rings
- C07D 419/04 . . directly linked by a ring-member-to-ring-member bond
- C07D 419/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- C07D 419/08 . . linked by a carbon chain containing alicyclic rings
- C07D 419/10 . . linked by a carbon chain containing aromatic rings
- C07D 419/12 . . linked by a chain containing hetero atoms as chain links
- C07D 419/14 . containing three or more hetero rings

**C07D 421/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having selenium, tellurium, or halogen atoms as ring hetero atoms**

- C07D 421/02 . containing two hetero rings
- C07D 421/04 . . directly linked by a ring-member-to-ring-member bond
- C07D 421/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- C07D 421/08 . . linked by a carbon chain containing alicyclic rings
- C07D 421/10 . . linked by a carbon chain containing aromatic rings
- C07D 421/12 . . linked by a chain containing hetero atoms as chain links
- C07D 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.

**C07D 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**

- C07D 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

- C07D 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
- C07D 451/06
  - Oxygen atoms
- C07D 451/08
  - Diarylmethoxy radicals
- C07D 451/10
  - acylated by aliphatic or araliphatic carboxylic acids, e.g. atropine, scopolamine
- C07D 451/12
  - acylated by aromatic or heteroaromatic carboxylic acids, e.g. cocaine
- C07D 451/14
  - containing 9-azabicyclo [3.3.1] nonane ring systems, e.g. granatane, 2-aza-adamantane; Cyclic acetals thereof

**C07D 453/00 Heterocyclic compounds containing quinuclidine or iso-quinuclidine ring systems, e.g. quinine alkaloids**

- C07D 453/02
  - containing not further condensed quinuclidine ring systems
- C07D 453/04
  - having a quinolyl-4, a substituted quinolyl-4 or a alkylenedioxy-quinolyl-4 radical linked through only one carbon atom, attached in position 2, e.g. quinine
- C07D 453/06
  - containing isoquinuclidine ring systems

**C07D 455/00 Heterocyclic compounds containing quinolizine ring systems, e.g. emetine alkaloids, protoberberine; Alkylenedioxy derivatives of dibenzo [a, g] quinolizines, e.g. berberine**

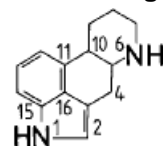
- C07D 455/02
  - containing not further condensed quinolizine ring systems
- C07D 455/03
  - containing quinolizine ring systems directly condensed with at least one six-membered carbocyclic ring, e.g. protoberberine; Alkylenedioxy derivatives of dibenzo [a, g] quinolizines, e.g. berberine

**WARNING**

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

- C07D 455/04
  - containing a quinolizine ring system condensed with only one six-membered carbocyclic ring, e.g. julolidine
- C07D 455/06
  - containing benzo [a] quinolizine ring systems
- C07D 455/08
  - having an isoquinolyl-1, a substituted isoquinolyl-1 or an alkylenedioxyisoquinolyl-1 radical linked through only one carbon atom, attached in position 2, e.g. emetine

**C07D 457/00 Heterocyclic compounds containing indolo [4, 3-f, g] quinoline ring systems, e.g. derivatives of ergoline, of the formula:**



, e.g.

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

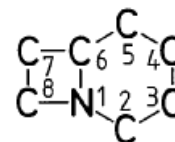
- C07D 457/02
  - with hydrocarbon or substituted hydrocarbon radicals, attached in position 8
- C07D 457/04
  - with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 8

- C07D 457/06 . . . Lysergic acid amides
- C07D 457/08 . . . . in which the amide nitrogen is a member of a heterocyclic ring
- C07D 457/10 . . with hetero atoms directly attached in position 8
- C07D 457/12 . . . Nitrogen atoms
- C07D 457/14 . . containing indolo [4, 3-f, g] quinoline ring systems condensed with carbocyclic rings or ring systems

**C07D 459/00 Heterocyclic compounds containing benz [g] indolo [2, 3-a] quinolizine ring systems, e.g. yohimbine; 16, 18-lactones thereof, e.g. reserpic acid lactone**

**C07D 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](#))**

**C07D 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

- C07D 463/02 . Preparation (by microbiological processes [C12P 17/18](#))
- C07D 463/04 . . by forming the ring or condensed ring systems
- C07D 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
- C07D 463/08 . . . . Modification of a carboxyl group directly attached in position 2, e.g. esterification
- C07D 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
- C07D 463/12 . . . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals attached in position 7
- C07D 463/14 . . . with hetero atoms directly attached in position 7
- C07D 463/16 . . . . Nitrogen atoms
- C07D 463/18 . . . . . further acylated by radicals derived from carboxylic acids or by nitrogen or sulfur analogues thereof
- C07D 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
- C07D 463/22 . . . . . further substituted by nitrogen atoms

**C07D 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](#) to [C07D 463/00](#)**

- C07D 471/02      . in which the condensed system contains two hetero rings
- C07D 471/04      . . Ortho-condensed systems ([carbacephalosporins C07D 463/00](#))
- C07D 471/06      . . Peri-condensed systems
- C07D 471/08      . . Bridged systems
- C07D 471/10      . . Spiro-condensed systems
- C07D 471/12      . in which the condensed system contains three hetero rings
- C07D 471/14      . . Ortho-condensed systems
- C07D 471/16      . . Peri-condensed systems
- C07D 471/18      . . Bridged systems
- C07D 471/20      . . Spiro-condensed systems
- C07D 471/22      . in which the condensed system contains four or more hetero rings

**C07D 473/00**      **Heterocyclic compounds containing purine ring systems**

- C07D 473/02      . with oxygen, sulfur or nitrogen atoms directly attached in positions 2 and 6
- C07D 473/04      . . two oxygen atoms
- C07D 473/06      . . . with radicals containing only hydrogen and carbon atoms, attached in position 1 or 3
- C07D 473/08      . . . . with methyl radicals in positions 1 and 3, e.g. theophylline
- C07D 473/10      . . . . with methyl radicals in positions 3 and 7, e.g. theobromine
- C07D 473/12      . . . . with methyl radicals in positions 1, 3 and 7, e.g. caffeine
- C07D 473/14      . . . . with two methyl radicals in positions 1 and 3 and two methyl radicals in positions 7, 8 or 9
- C07D 473/16      . . two nitrogen atoms
- C07D 473/18      . . one oxygen and one nitrogen atom, e.g. guanine
- C07D 473/20      . . two sulfur atoms
- C07D 473/22      . . one oxygen and one sulfur atom
- C07D 473/24      . . one nitrogen and one sulfur atom
- C07D 473/26      . with an oxygen, sulfur or nitrogen atom directly attached in position 2 or 6, but not in both
- C07D 473/28      . . Oxygen atom
- C07D 473/30      . . . attached in position 6, e.g. hypoxanthine
- C07D 473/32      . . Nitrogen atom
- C07D 473/34      . . . attached in position 6, e.g. adenine
- C07D 473/36      . . Sulfur atom
- C07D 473/38      . . . attached in position 6
- C07D 473/40      . with halogen atoms or perhalogeno-alkyl radicals directly attached in positions 2 or 6



**C07D 475/00****Heterocyclic compounds containing pteridine ring systems**

C07D 475/02

- with an oxygen atom directly attached in position 4

C07D 475/04

- with a nitrogen atom directly attached in position 2

C07D 475/06

- with a nitrogen atom directly attached in position 4

C07D 475/08

- with a nitrogen atom directly attached in position 2

C07D 475/10

- with an aromatic or hetero-aromatic ring directly attached in position 2

C07D 475/12

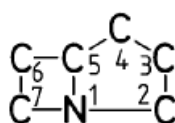
- containing pteridine ring systems condensed with carbocyclic rings or ring systems

C07D 475/14

- Benz [g] pteridines, e.g. riboflavin

**C07D 477/00****Heterocyclic compounds containing 1-azabicyclo [3.2.0] heptane ring systems, i.e. compounds containing a ring system of the formula:**

, carbapenicillins, thienamycins; Such ring systems being

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

C07D 477/02

- Preparation (by [microbiological processes C12P 17/18](#))

C07D 477/04

- by forming the ring or condensed ring systems

C07D 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

C07D 477/08

- Modification of a carboxyl group directly attached in position 2, e.g. esterification

C07D 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

C07D 477/12

- with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached in position 6

C07D 477/14

- with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached in position 3

C07D 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

C07D 477/18

- Oxygen atoms

C07D 477/20

- Sulfur atoms

C07D 477/22

- Nitrogen atoms

C07D 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

C07D 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

**C07D 487/00**

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

C07D 487/02

- in which the condensed system contains two hetero rings

C07D 487/04

- . Ortho-condensed systems ([carbapenams](#), e.g. [thienamycins](#), [C07D 477/00](#))

C07D 487/06

- . Peri-condensed systems

C07D 487/08

- . Bridged systems

C07D 487/10

- . Spiro-condensed systems

C07D 487/12

- in which the condensed system contains three hetero rings

C07D 487/14

- . Ortho-condensed systems

C07D 487/16

- . Peri-condensed systems

C07D 487/18

- . Bridged systems

C07D 487/20

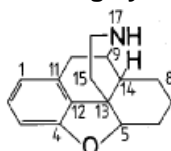
- . Spiro-condensed systems

C07D 487/22

- in which the condensed system contains four or more hetero rings

**C07D 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:**



C07D 489/02

- with oxygen atoms attached in positions 3 and 6, e.g. morphine, morphinone

C07D 489/04

- . Salts; Organic complexes

C07D 489/06

- with a hetero atom directly attached in position 14

C07D 489/08

- . Oxygen atom

C07D 489/09

- containing 4aH-8, 9 c-Iminoethano- phenanthro [4, 5-b, c, d] furan ring systems condensed with carbocyclic rings or ring systems

C07D 489/10

- . with a bridge between positions 6 and 14

C07D 489/12

- . . the bridge containing only two carbon atoms

**C07D 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](#) to [C07D 459/00](#), [C07D 463/00](#), [C07D 477/00](#) or [C07D 489/00](#)**

C07D 491/02

- in which the condensed system contains two hetero rings

C07D 491/04

- . Ortho-condensed systems

C07D 491/044

- . . with only one oxygen atom as ring hetero atom in the oxygen-containing ring

C07D 491/048

- . . . the oxygen-containing ring being five-membered

C07D 491/052

- . . . the oxygen-containing ring being six-membered

C07D 491/056

- . . with two or more oxygen atoms as ring hetero atoms in the oxygen-containing ring

- C07D 491/06
  - . . Peri-condensed systems
- C07D 491/08
  - . . Bridged systems
- C07D 491/10
  - . . Spiro-condensed systems
- C07D 491/107
  - . . . with only one oxygen atom as ring hetero atom in the oxygen-containing ring
- C07D 491/113
  - . . . with two or more oxygen atoms as ring hetero atoms in the oxygen-containing ring
- C07D 491/12
  - . in which the condensed system contains three hetero rings
- C07D 491/14
  - . . Ortho-condensed systems ([alkylenedioxy derivatives of dibenzo \[a, g\] quinolizines](#), e.g. [berberine](#), [C07D 455/03](#))
- C07D 491/147
  - . . . the condensed system containing one ring with oxygen as ring hetero atom and two rings with nitrogen as ring hetero atom
- C07D 491/153
  - . . . the condensed system containing two rings with oxygen as ring hetero atom and one ring with nitrogen as ring hetero atom
- C07D 491/16
  - . . Peri-condensed systems
- C07D 491/18
  - . . Bridged systems ([3-oxa-9-azatricyclo \[3.3.1.0<2,4>\] nonane ring systems](#), e.g. [scopolamine](#), [C07D 451/00](#))
- C07D 491/20
  - . . Spiro-condensed systems
- C07D 491/22
  - . in which the condensed system contains four or more hetero rings

**C07D 493/00 Heterocyclic compounds containing oxygen atoms as the only ring hetero atoms in the condensed system**

- C07D 493/02
  - . in which the condensed system contains two hetero rings
- C07D 493/04
  - . . Ortho-condensed systems
- C07D 493/06
  - . . Peri-condensed systems
- C07D 493/08
  - . . Bridged systems
- C07D 493/10
  - . . Spiro-condensed systems
- C07D 493/12
  - . in which the condensed system contains three hetero rings
- C07D 493/14
  - . . Ortho-condensed systems
- C07D 493/16
  - . . Peri-condensed systems
- C07D 493/18
  - . . Bridged systems
- C07D 493/20
  - . . Spiro-condensed systems
- C07D 493/22
  - . in which the condensed system contains four or more hetero rings

**C07D 495/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having sulfur atoms as the only ring hetero atoms**

- C07D 495/02
  - . in which the condensed system contains two hetero rings
- C07D 495/04
  - . . Ortho-condensed systems
- C07D 495/06
  - . . Peri-condensed systems
- C07D 495/08
  - . . Bridged systems
- C07D 495/10
  - . . Spiro-condensed systems
- C07D 495/12
  - . in which the condensed system contains three hetero rings
- C07D 495/14
  - . . Ortho-condensed systems

- C07D 495/16 . . . . . Peri-condensed systems
- C07D 495/18 . . . . . Bridged systems
- C07D 495/20 . . . . . Spiro-condensed systems
- C07D 495/22 . . . . . in which the condensed system contains four or more hetero rings

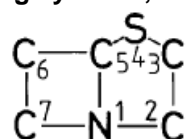
**C07D 497/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having oxygen and sulfur atoms as the only ring hetero atoms**

- C07D 497/02 . . . . . in which the condensed system contains two hetero rings
- C07D 497/04 . . . . . Ortho-condensed systems
- C07D 497/06 . . . . . Peri-condensed systems
- C07D 497/08 . . . . . Bridged systems
- C07D 497/10 . . . . . Spiro-condensed systems
- C07D 497/12 . . . . . in which the condensed system contains three hetero rings
- C07D 497/14 . . . . . Ortho-condensed systems
- C07D 497/16 . . . . . Peri-condensed systems
- C07D 497/18 . . . . . Bridged systems
- C07D 497/20 . . . . . Spiro-condensed systems
- C07D 497/22 . . . . . in which the condensed system contains four or more hetero rings

**C07D 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](#))

- C07D 498/02 . . . . . in which the condensed system contains two hetero rings
- C07D 498/04 . . . . . Ortho-condensed systems
- C07D 498/06 . . . . . Peri-condensed systems
- C07D 498/08 . . . . . Bridged systems
- C07D 498/10 . . . . . Spiro-condensed systems
- C07D 498/12 . . . . . in which the condensed system contains three hetero rings
- C07D 498/14 . . . . . Ortho-condensed systems
- C07D 498/16 . . . . . Peri-condensed systems
- C07D 498/18 . . . . . Bridged systems
- C07D 498/20 . . . . . Spiro-condensed systems
- C07D 498/22 . . . . . in which the condensed system contains four or more hetero rings

**C07D 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:**



, e.g. penicillins, penems; Such ring systems being

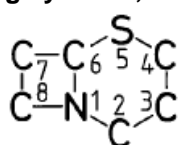
further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring

- C07D 499/04 . Preparation
- C07D 499/06 . . by forming the ring or condensed ring systems ([by microbiological processes C12P 37/00](#))
- C07D 499/08 . . Modification of a carboxyl radical directly attached in position 2, e.g. esterification
- C07D 499/10 . . Modification of an amino radical directly attached in position 6
- C07D 499/12 . . . Acylation
- C07D 499/14 . . Preparation of salts
- C07D 499/16 . . . of alkali or alkaline earth metals
- C07D 499/18 . . Separation; Purification
- C07D 499/20 . . . via salts with organic bases
- C07D 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
- C07D 499/22 . . Salts with organic bases; Complexes with organic compounds
- C07D 499/24 . . . with acyclic or carbocyclic compounds containing amino radicals
- C07D 499/26 . . . with heterocyclic compounds
- C07D 499/28 . . with modified 2-carboxyl group
- C07D 499/30 . . . Acid anhydride
- C07D 499/32 . . . Esters
- C07D 499/34 . . . Thio-acid; Esters thereof
- C07D 499/36 . . . . O-esters
- C07D 499/38 . . . . S-esters
- C07D 499/40 . . . Amides; Hydrazides; Azides
- C07D 499/42 . . Compounds with a free primary amino radical attached in position 6
- C07D 499/44 . . Compounds with an amino radical acylated by carboxylic acids, attached in position 6
- C07D 499/46 . . . with acyclic hydrocarbon radicals or such radicals substituted by carbocyclic or heterocyclic rings, attached to the carboxamido radical
- C07D 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
- C07D 499/50 . . . . substituted in beta-position to the carboxamido radical
- C07D 499/52 . . . . . by oxygen or sulfur atoms
- C07D 499/54 . . . . . by nitrogen atoms
- C07D 499/56 . . . . . by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- C07D 499/58 . . . . substituted in alpha-position to the carboxamido radical
- C07D 499/60 . . . . . by oxygen atoms
- C07D 499/62 . . . . . by sulfur atoms
- C07D 499/64 . . . . . by nitrogen atoms
- C07D 499/66 . . . . . with alicyclic rings as additional substituents on the carbon chain

- C07D 499/68 . . . . . with aromatic rings as additional substituents on the carbon chain
- C07D 499/70 . . . . . with hetero rings as additional substituents on the carbon chain
- C07D 499/72 . . . . . by carbon atoms having three bonds to hetero atoms
- C07D 499/74 . . . with carbocyclic rings directly attached to the carboxamido radical
- C07D 499/76 . . . with hetero rings directly attached to the carboxamido radical
- C07D 499/78 . . Compounds with an amino radical, acylated by carbonic acid, or by nitrogen or sulfur analogues thereof, attached in position 6
- C07D 499/80 . . Compounds with a nitrogen-containing hetero ring, attached with the ring nitrogen atom in position 6
- C07D 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
- C07D 499/861 . . with a hydrocarbon radical or a substituted hydrocarbon radical, directly attached in position 6
- C07D 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
- C07D 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
- C07D 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
- C07D 499/881 . . with a hydrogen atom or an unsubstituted hydrocarbon radical, attached in position 3
- C07D 499/883 . . with a substituted hydrocarbon radical attached in position 3
- C07D 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
- C07D 499/893 . . with a hetero ring or a condensed hetero ring system, directly attached in position 3
- C07D 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
- C07D 499/90 . further condensed with carbocyclic rings or ring systems

**C07D 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**

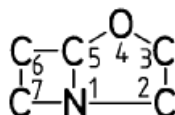
- C07D 501/02 . Preparation

- C07D 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
- C07D 501/06
  - • • Acylation of 7-aminocephalosporanic acid
- C07D 501/08
  - • by forming the ring or condensed ring systems ([by microbiological processes C12P 35/00](#))
- C07D 501/10
  - • • from compounds containing the penicillin ring system
- C07D 501/12
  - • Separation; Purification
- C07D 501/14
  - Compounds having a nitrogen atom directly attached in position 7
- C07D 501/16
  - • with a double bond between positions 2 and 3
- C07D 501/18
  - • • 7-Aminocephalosporanic or substituted 7-aminocephalosporanic acids
- C07D 501/20
  - • • 7-Acylaminocephalosporanic or substituted 7-acylaminocephalosporanic acids in which the acyl radicals are derived from carboxylic acids
- C07D 501/22
  - • • • with radicals containing only hydrogen and carbon atoms, attached in position 3
- C07D 501/24
  - • • • with hydrocarbon radicals, substituted by hetero atoms or hetero rings, attached in position 3
- C07D 501/26
  - • • • • Methylene radicals, substituted by oxygen atoms; Lactones thereof with the 2-carboxyl group
- C07D 501/28
  - • • • • with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
- C07D 501/30
  - • • • • with the 7-amino-radical acylated by an araliphatic carboxylic acid
- C07D 501/32
  - • • • • with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
- C07D 501/34
  - • • • • with the 7-amino radical acylated by carboxylic acids containing hetero rings
- C07D 501/36
  - • • • • Methylene radicals, substituted by sulfur atoms
- C07D 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
- C07D 501/40
  - • • • • with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
- C07D 501/42
  - • • • • with the 7-amino radical acylated by an araliphatic carboxylic acid
- C07D 501/44
  - • • • • with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
- C07D 501/46
  - • • • • with the 7-amino radical acylated by carboxylic acids containing hetero rings
- C07D 501/48
  - • • • • Methylene radicals, substituted by hetero rings ([C07D 501/38 to C07D 501/46 take precedence](#))
- C07D 501/50
  - • • • • with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms



- C07D 501/52 . . . . . with the 7-amino radical acylated by an araliphatic carboxylic acid
- C07D 501/54 . . . . . with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
- C07D 501/56 . . . . . with the 7-amino radical acylated by carboxylic acids containing hetero rings
- C07D 501/57 . . . . . with a further substituent in position 7, e.g. cephamycines
- C07D 501/58 . . . . . with a nitrogen atom, which is a member of a hetero ring, attached in position 7
- C07D 501/59 . . . . . with hetero atoms directly attached in position 3
- C07D 501/60 . . . . . with a double bond between positions 3 and 4
- C07D 501/62 . . . . . Compounds further condensed with a carbocyclic ring or ring system

**C07D 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**

- C07D 503/02 . . . . . Preparation (by [microbiological processes C12P 17/18](#))
- C07D 503/04 . . . . . by forming the ring or condensed ring systems
- C07D 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
- C07D 503/08 . . . . . Modification of a carboxyl group directly attached in position 2, e.g. esterification
- C07D 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
- C07D 503/12 . . . . . unsubstituted in position 6
- C07D 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
- C07D 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
- C07D 503/18 . . . . . by oxygen atoms
- C07D 503/20 . . . . . by sulfur atoms
- C07D 503/22 . . . . . by nitrogen atoms

**C07D 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**

**C07D 505/02**

- Preparation (by [microbiological processes C12P 17/18](#))

**C07D 505/04**

- by forming the ring or condensed ring systems

**C07D 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

**C07D 505/08**

- Modification of a carboxyl group directly attached in position 2, e.g. esterification

**C07D 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

**C07D 505/12**

- substituted in position 7

**C07D 505/14**

- with hetero atoms directly attached in position 7

**C07D 505/16**

- Nitrogen atoms

**C07D 505/18**

- further acylated by radicals derived from carboxylic acids or by nitrogen or sulfur analogues thereof

**C07D 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

**C07D 505/22**

- further substituted by singly-bound nitrogen atoms

**C07D 505/24**

- further substituted by doubly-bound nitrogen atoms

**C07D 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](#) to [C07D 505/00](#); Such ring systems being further condensed**

**C07D 507/02**

- containing 3-oxa-1-azabicyclo [3.2.0] heptane ring systems

**C07D 507/04**

- containing 2-oxa-1-azabicyclo [4.2.0] octane ring systems

**C07D 507/06**

- containing 3-oxa-1-azabicyclo [4.2.0] octane ring systems

**C07D 507/08**

- containing 4-oxa-1-azabicyclo [4.2.0] octane ring systems

**C07D 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](#) to [C07D 507/00](#)**

**C07D 513/02**

- in which the condensed system contains two hetero rings

**C07D 513/04**

- Ortho-condensed systems

**C07D 513/06**

- Peri-condensed systems

**C07D 513/08**

- Bridged systems

**C07D 513/10**

- Spiro-condensed systems

**C07D 513/12**

- in which the condensed system contains three hetero rings

**C07D 513/14**

- Ortho-condensed systems

- C07D 513/16
  - . . Peri-condensed systems
- C07D 513/18
  - . . Bridged systems
- C07D 513/20
  - . . Spiro-condensed systems
- C07D 513/22
  - . in which the condensed system contains four or more hetero rings
- C07D 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](#) to [C07D 507/00](#)**
- C07D 515/02
  - . in which the condensed system contains two hetero rings
- C07D 515/04
  - . . Ortho-condensed systems
- C07D 515/06
  - . . Peri-condensed systems
- C07D 515/08
  - . . Bridged systems
- C07D 515/10
  - . . Spiro-condensed systems
- C07D 515/12
  - . in which the condensed system contains three hetero rings
- C07D 515/14
  - . . Ortho-condensed systems
- C07D 515/16
  - . . Peri-condensed systems
- C07D 515/18
  - . . Bridged systems
- C07D 515/20
  - . . Spiro-condensed systems
- C07D 515/22
  - . in which the condensed system contains four or more hetero rings
- C07D 517/00**
  - Heterocyclic compounds containing in the condensed system at least one hetero ring having selenium, tellurium or halogen atoms as ring hetero atoms**
- C07D 517/02
  - . in which the condensed system contains two hetero rings
- C07D 517/04
  - . . Ortho-condensed systems
- C07D 517/06
  - . . Peri-condensed systems
- C07D 517/08
  - . . Bridged systems
- C07D 517/10
  - . . Spiro-condensed systems
- C07D 517/12
  - . in which the condensed system contains three hetero rings
- C07D 517/14
  - . . Ortho-condensed systems
- C07D 517/16
  - . . Peri-condensed systems
- C07D 517/18
  - . . Bridged systems
- C07D 517/20
  - . . Spiro-condensed systems
- C07D 517/22
  - . in which the condensed system contains four or more hetero rings
- C07D 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](#)**
- C07D 519/02
  - . Ergot alkaloids of the cyclic peptide type
- C07D 519/04
  - . Dimeric indole alkaloids, e.g. vincaleucoblastine
- C07D 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](#) to [C07D 507/00](#), e.g. a penem or a cepham system

**C07D 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](#) to [C07D 519/00](#)