

# CPC COOPERATIVE PATENT CLASSIFICATION

## C07D HETEROCYCLIC COMPOUNDS

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

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

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

- 203/00 Heterocyclic compounds containing three-membered rings with one nitrogen atom as the only ring hetero atom**
- 203/02 . Preparation by ring-closure
  - 203/04 . not condensed with other rings
  - 203/06 . . having no double bonds between ring members or between ring members and non-ring members
  - 203/08 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring nitrogen atom
  - 203/10 . . . . Radicals substituted by singly bound oxygen atoms
  - 203/12 . . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
  - 203/14 . . . . with carbocyclic rings directly attached to the ring nitrogen atom
  - 203/16 . . . with acylated ring nitrogen atoms
  - 203/18 . . . . by carboxylic acids, or by sulfur or nitrogen analogues thereof
  - 203/20 . . . . by carbonic acid, or by sulfur or nitrogen analogues thereof, e.g. carbamates
  - 203/22 . . . with hetero atoms directly attached to the ring nitrogen atom
  - 203/24 . . . . Sulfur atoms
  - 203/26 . condensed with carbocyclic rings or ring systems
- 205/00 Heterocyclic compounds containing four-membered rings with one nitrogen atom as the only ring hetero atom**
- 205/02 . not condensed with other rings
  - 205/04 . . having no double bonds between ring members or between ring members and non-ring members
  - 205/06 . . having one double bond between ring members or between a ring member and a non-ring member
  - 205/08 . . . with one oxygen atom directly attached in position 2, e.g. beta-lactams
  - 205/085 . . . . with a nitrogen atom directly attached in position 3

- 205/09 . . . . with a sulfur atom directly attached in position 4
  - 205/095 . . . . . and with a nitrogen atom directly attached in position 3
  - 205/10 . . having two double bonds between ring members or between ring members and non-ring members
  - 205/12 . condensed with carbocyclic rings or ring systems
- 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](#)
- 207/02 . with only hydrogen or carbon atoms directly attached to the ring nitrogen atom
  - 207/04 . . having no double bonds between ring members or between ring members and non-ring members
  - 207/06 . . . with radicals, containing only hydrogen and carbon atoms, attached to ring carbon atoms
  - 207/08 . . . with hydrocarbon radicals, substituted by hetero atoms, attached to ring carbon atoms
  - 207/09 . . . . Radicals substituted by nitrogen atoms, not forming part of a nitro radical
  - 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
  - 207/12 . . . . Oxygen or sulfur atoms
  - 207/14 . . . . Nitrogen atoms not forming part of a nitro radical
  - 207/16 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
  - 207/18 . . having one double bond between ring members or between a ring member and a non-ring member
  - 207/20 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
  - 207/22 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
  - 207/24 . . . . Oxygen or sulfur atoms
  - 207/26 . . . . . 2-Pyrrolidones
  - 207/263 . . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms
  - 207/267 . . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to the ring nitrogen atom

207/27	. . . . . with substituted hydrocarbon radicals directly attached to the ring nitrogen atom	207/448	. . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms, e.g. maleimide
207/273	. . . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to other ring carbon atoms	207/452	. . . . . with hydrocarbon radicals, substituted by hetero atoms, directly attached to the ring nitrogen atom
207/277	. . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals	207/456	. . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to other ring carbon atoms
207/28	. . . . . 2-Pyrrolidone-5- carboxylic acids; Functional derivatives thereof, e.g. esters, nitriles	207/46	. with hetero atoms directly attached to the ring nitrogen atom
207/30	. . having two double bonds between ring members or between ring members and non-ring members	207/48	. . Sulfur atoms
207/32	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	207/50	. . Nitrogen atoms
207/323	. . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to the ring nitrogen atoms	<b>209/00</b>	<b>Heterocyclic compounds containing five-membered rings, condensed with other rings, with one nitrogen atom as the only ring hetero atom</b>
207/325	. . . . with substituted hydrocarbon radicals directly attached to the ring nitrogen atom	209/02	. condensed with one carbocyclic ring
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	209/04	. . Indoles; Hydrogenated indoles
207/33	. . . . with substituted hydrocarbon radicals, directly attached to ring carbon atoms	209/06	. . . Preparation of indole from coal-tar
207/333	. . . . Radicals substituted by oxygen or sulfur atoms	209/08	. . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to carbon atoms of the hetero ring
207/335	. . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical	209/10	. . . with substituted hydrocarbon radicals attached to carbon atoms of the hetero ring
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	209/12	. . . . Radicals substituted by oxygen atoms
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	209/14	. . . . Radicals substituted by nitrogen atoms, not forming part of a nitro radical
207/36	. . . . Oxygen or sulfur atoms	209/16	. . . . . Tryptamines
207/38	. . . . . 2-Pyrrolones	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
207/40	. . . . . 2,5-Pyrrolidine-diones	209/20	. . . . . substituted additionally by nitrogen atoms, e.g. tryptophane
207/404	. . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms, e.g. succinimide	209/22	. . . . . with an aralkyl radical attached to the ring nitrogen atom
207/408	. . . . . Radicals containing only hydrogen and carbon atoms attached to ring carbon atoms	209/24	. . . . . with an alkyl or cycloalkyl radical attached to the ring nitrogen atom
207/412	. . . . . Acyclic radicals containing more than six carbon atoms	209/26	. . . . . with an acyl radical attached to the ring nitrogen atom
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	209/28	. . . . . 1-(4-Chlorobenzoyl)-2-methyl-indolyl-3-acetic acid, substituted in position 5 by an oxygen or nitrogen atom; Esters thereof
207/42	. . . . Nitro radicals	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
207/44	. . having three double bonds between ring members or between ring members and non-ring members	209/32	. . . . Oxygen atoms
207/444	. . . having two doubly-bound oxygen atoms directly attached in positions 2 and 5	209/34	. . . . . in position 2
		209/36	. . . . . in position 3, e.g. adrenochrome
		209/38	. . . . . in position 2 and 3, e.g. isatin
		209/40	. . . . Nitrogen atoms, not forming part of a nitro radical, e.g. isatin semicarbazone
		209/42	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
		209/43	. . . with an -OCH <sub>2</sub> CH(OH)CH <sub>2</sub> NH <sub>2</sub> radical, which may be further substituted, attached in positions 4, 5, 6 or 7

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

- 211/72 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, directly attached to ring carbon atoms
- 211/74 . . . . Oxygen atoms
- 211/76 . . . . . attached in position 2 or 6
- 211/78 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 211/80 . . having two double bonds between ring members or between ring members and non-ring members
- 211/82 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 211/84 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen directly attached to ring carbon atoms
- 211/86 . . . . Oxygen atoms
- 211/88 . . . . . attached in positions 2 and 6, e.g. glutarimide
- 211/90 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 211/92 . with a hetero atom directly attached to the ring nitrogen atom
- 211/94 . . Oxygen atom, e.g. piperidine N-oxide
- 211/96 . . Sulfur atom
- 211/98 . . Nitrogen atom
- 213/00 Heterocyclic compounds containing six-membered rings, not condensed with other rings, with one nitrogen atom as the only ring hetero atom and three or more double bonds between ring members or between ring members and non-ring members**
- 213/02 . having three double bonds between ring members or between ring members and non-ring members
- 213/04 . . having no bond between the ring nitrogen atom and a non-ring member or having only hydrogen or carbon atoms directly attached to the ring nitrogen atom
- 213/06 . . . containing only hydrogen and carbon atoms in addition to the ring nitrogen atom
- 213/08 . . . . Preparation by ring-closure
- 213/09 . . . . . involving the use of ammonia, amines, amine salts, or nitriles
- 213/10 . . . . . from acetaldehyde or cyclic polymers thereof
- 213/12 . . . . . from unsaturated compounds
- 213/127 . . . . Preparation from compounds containing pyridine rings
- 213/133 . . . . Preparation by dehydrogenation of hydrogenated pyridine compounds
- 213/14 . . . . Preparation from compounds containing heterocyclic oxygen
- 213/16 . . . . Containing only one pyridine ring
- 213/18 . . . . . Salts thereof
- 213/20 . . . . . Quaternary compounds thereof
- 213/22 . . . . . containing two or more pyridine rings directly linked together, e.g. bipyridyl
- 213/24 . . . with substituted hydrocarbon radicals attached to ring carbon atoms
- 213/26 . . . . Radicals substituted by halogen atoms or nitro radicals
- 213/28 . . . . Radicals substituted by singly-bound oxygen or sulfur atoms ([bound to the same carbon atom C07D 213/44](#))
- 213/30 . . . . . Oxygen atoms
- 213/32 . . . . . Sulfur atoms
- 213/34 . . . . . to which a second heteroatom is attached
- 213/36 . . . . Radicals substituted by singly-bound nitrogen atoms ([nitro radicals C07D 213/26](#))
- 213/38 . . . . . having only hydrogen, hydrocarbon radicals attached to the substituent nitrogen atom
- 213/40 . . . . . Acylated substituent nitrogen atom
- 213/42 . . . . . having hetero atoms attached to the substituent nitrogen atom ([nitro radicals C07D 213/26](#))
- 213/44 . . . . Radicals substituted by doubly-bound oxygen, sulfur, or nitrogen atoms, or by two such atoms singly-bound to the same carbon atom
- 213/46 . . . . . Oxygen atoms
- 213/48 . . . . . Aldehydo radicals
- 213/50 . . . . . Ketonic radicals
- 213/51 . . . . . Acetal radicals
- 213/52 . . . . . Sulfur atoms
- 213/53 . . . . . Nitrogen atoms
- 213/54 . . . . Radicals substituted by carbon atoms having three bonds to heteroatoms, with at the most one to halogen, e.g. ester or nitrile radicals
- 213/55 . . . . . Acids; Esters
- 213/56 . . . . . Amides
- 213/57 . . . . . Nitriles
- 213/58 . . . . . Amidines
- 213/59 . . . . . with at least one of the bonds being to sulfur
- 213/60 . . . with heteroatoms or with carbon atoms having three bonds to hetero atoms, with at the most one to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 213/61 . . . . Halogen atoms or nitro radicals
- 213/62 . . . . Oxygen or sulfur atoms
- 213/63 . . . . . One oxygen atom
- 213/64 . . . . . attached in position 2 or 6
- 213/643 . . . . . 2-Phenoxypyridines; Derivatives thereof
- 213/647 . . . . . and having in the molecule an acyl radical containing a saturated three-membered ring, e.g. chrysanthemic acid esters
- 213/65 . . . . . attached in position 3 or 5
- 213/66 . . . . . having in position 3 an oxygen atom and in each of the positions 4 and 5 a carbon atom bound to an oxygen, sulfur or nitrogen atom, e.g. pyridoxal
- 213/67 . . . . . 2-Methyl-3-hydroxy-4,5-bis(hydroxy-methyl)pyridine, i.e. pyridoxine
- 213/68 . . . . . attached in position 4
- 213/69 . . . . . Two or more oxygen atoms
- 213/70 . . . . . Sulfur atoms
- 213/71 . . . . . to which a second hetero atom is attached
- 213/72 . . . . Nitrogen atoms ([nitro radicals C07D 213/61](#))
- 213/73 . . . . . Unsubstituted amino or imino radicals

- 213/74 . . . . . Amino or imino radicals substituted by hydrocarbon or substituted hydrocarbon radicals
- 213/75 . . . . . Amino or imino radicals, acylated by carboxylic or carbonic acids, or by sulfur or nitrogen analogues thereof, e.g. carbamates
- 213/76 . . . . . to which a second hetero atom is attached ([nitro radicals C07D 213/61](#))
- 213/77 . . . . . Hydrazine radicals
- 213/78 . . . . . Carbon atoms having three bonds to hetero atoms, with at the most one to halogen, e.g. ester or nitrile radicals
- 213/79 . . . . . Acids; Esters
- 213/80 . . . . . in position 3
- 213/803 . . . . . Processes of preparation
- 213/807 . . . . . by oxidation of pyridines or condensed pyridines
- 213/81 . . . . . Amides; Imides
- 213/82 . . . . . in position 3
- 213/83 . . . . . Thio-acids; Thio-esters; Thio-amides; Thio-imides
- 213/84 . . . . . Nitriles
- 213/85 . . . . . in position 3
- 213/86 . . . . . Hydrazides; Thio or imino analogues thereof
- 213/87 . . . . . in position 3
- 213/88 . . . . . Nicotinoylhydrazones
- 213/89 . . with hetero atoms directly attached to the ring nitrogen atom
- 213/90 . having more than three double bonds between ring members or between ring members and non-ring members
- 215/00 Heterocyclic compounds containing quinoline or hydrogenated quinoline ring systems**
- 215/02 . having no bond between the ring nitrogen atom and a non-ring member or having only hydrogen atoms or carbon atoms directly attached to the ring nitrogen atom
- 215/04 . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to the ring carbon atoms
- 215/06 . . . having only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to the ring nitrogen atom
- 215/08 . . . with acylated ring nitrogen atom
- 215/10 . . . Quaternary compounds
- 215/12 . . with substituted hydrocarbon radicals attached to ring carbon atoms
- 215/14 . . . Radicals substituted by oxygen atoms
- 215/16 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 215/18 . . . Halogen atoms or nitro radicals
- 215/20 . . . Oxygen atoms ([quinophthalones C09B 25/00](#))
- 215/22 . . . . attached in position 2 or 4
- 215/227 . . . . . only one oxygen atom which is attached in position 2
- 215/233 . . . . . only one oxygen atom which is attached in position 4
- 215/24 . . . . attached in position 8
- 215/26 . . . . . Alcohols; Ethers thereof
- 215/28 . . . . . with halogen atoms or nitro radicals in positions 5, 6 or 7
- 215/30 . . . . . Metal salts; Chelates
- 215/32 . . . . . Esters
- 215/34 . . . . . Carbamates
- 215/36 . . . Sulfur atoms ([C07D 215/24 takes precedence](#))
- 215/38 . . . Nitrogen atoms ([nitro radicals C07D 215/18](#))
- 215/40 . . . . attached in position 8
- 215/42 . . . . attached in position 4
- 215/44 . . . . . with aryl radicals attached to said nitrogen atoms
- 215/46 . . . . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to said nitrogen atoms
- 215/48 . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 215/50 . . . . attached in position 4
- 215/52 . . . . . with aryl radicals attached in position 2
- 215/54 . . . . attached in position 3
- 215/56 . . . . . with oxygen atoms in position 4
- 215/58 . with hetero atoms directly attached to the ring nitrogen atom
- 215/60 . . N-oxides
- 217/00 Heterocyclic compounds containing isoquinoline or hydrogenated isoquinoline ring systems**
- 217/02 . with only hydrogen atoms or radicals containing only carbon and hydrogen atoms, directly attached to carbon atoms of the nitrogen-containing ring; Alkylene-bis-isoquinolines
- 217/04 . . with hydrocarbon or substituted hydrocarbon radicals attached to the ring nitrogen atom
- 217/06 . . with the ring nitrogen atom acylated by carboxylic or carbonic acids, or with sulfur or nitrogen analogues thereof, e.g. carbamates
- 217/08 . . with a hetero atom directly attached to the ring nitrogen atom
- 217/10 . . Quaternary compounds
- 217/12 . with radicals, substituted by hetero atoms, attached to carbon atoms of the nitrogen-containing ring
- 217/14 . . other than aralkyl radicals
- 217/16 . . . substituted by oxygen atoms
- 217/18 . . Aralkyl radicals
- 217/20 . . . with oxygen atoms directly attached to the aromatic ring of said aralkyl radical, e.g. papaverine
- 217/22 . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the nitrogen-containing ring
- 217/24 . . Oxygen atoms
- 217/26 . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 219/00 Heterocyclic compounds containing acridine or hydrogenated acridine ring systems**
- 219/02 . with only hydrogen, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the ring system
- 219/04 . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the ring system
- 219/06 . . Oxygen atoms



- 219/08 . . Nitrogen atoms ([acridine dyes C09B 15/00](#))
- 219/10 . . . attached in position 9
- 219/12 . . . . Amino-alkyl-amino radicals attached in position 9
- 219/14 . with hydrocarbon radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom
- 219/16 . with acyl radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom

**221/00 Heterocyclic compounds containing six-membered rings having one nitrogen atom as the only ring hetero atom, not provided for by groups [C07D 211/00](#) - [C07D 219/00](#)**

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

**223/00 Heterocyclic compounds containing seven-membered rings having one nitrogen atom as the only ring hetero atom**

**NOTE**

Hexamethylene imines or 3-aza-bicyclo [3.2.2] nonanes, having only hydrogen atoms attached to the ring carbon atoms, are classified in [C07D 295/00](#)

- 223/02 . not condensed with other rings
- 223/04 . . with only hydrogen atoms, halogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 223/06 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms ([halogen atoms C07D 223/04](#))
- 223/08 . . . Oxygen atoms
- 223/10 . . . . attached in position 2
- 223/12 . . . Nitrogen atoms not forming part of a nitro radical
- 223/14 . condensed with carbocyclic rings or ring systems
- 223/16 . . Benzazepines; Hydrogenated benzazepines
- 223/18 . . Dibenzazepines; Hydrogenated dibenzazepines
- 223/20 . . . Dibenz [b, e] azepines; Hydrogenated dibenz [b, e] azepines
- 223/22 . . . Dibenz [b, f] azepines; Hydrogenated dibenz [b, f] azepines
- 223/24 . . . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom
- 223/26 . . . . . having a double bond between positions 10 and 11

- 223/28 . . . . . having a single bond between positions 10 and 11
- 223/30 . . . . with hetero atoms directly attached to the ring nitrogen atom
- 223/32 . . containing carbocyclic rings other than six-membered

**225/00 Heterocyclic compounds containing rings of more than seven members having one nitrogen atom as the only ring hetero atom**

**NOTE**

Polymethyleneimines with at least five ring members and having only hydrogen atoms attached to the ring carbon atoms are classified in group [C07D 295/00](#)

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

**227/00 Heterocyclic compounds containing rings having one nitrogen atom as the only ring hetero atom, according to more than one of groups [C07D 203/00](#) - [C07D 225/00](#)**

**NOTE**

Polymethyleneimines with at least five ring members and having only hydrogen atoms attached to the ring carbon atoms are classified in group [C07D 295/00](#)

- 227/02 . with only hydrogen or carbon atoms directly attached to the ring nitrogen atom
- 227/04 . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to ring carbon atoms
- 227/06 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 227/08 . . . Oxygen atoms
- 227/087 . . . . One doubly-bound oxygen atom in position 2, e.g. lactams
- 227/093 . . . . Two doubly-bound oxygen atoms attached to the carbon atoms adjacent to the ring nitrogen atom, e.g. dicarboxylic acid imides
- 227/10 . . . Nitrogen atoms not forming part of a nitro radical
- 227/12 . with hetero atoms directly attached to the ring nitrogen atom

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

- 229/02 . containing three-membered rings

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

- 231/02 . not condensed with other rings
- 231/04 . . having no double bonds between ring members or between ring members and non-ring members
- 231/06 . . having one double bond between ring members or between ring members and non-ring members
- 231/08 . . . with oxygen or sulfur atoms directly attached to ring carbon atoms

231/10	. . having two or three double bonds between ring members or between ring members and non-ring members	233/16	. . . . Radicals substituted by nitrogen atoms
231/12	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	233/18	. . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one to halogen, e.g. ester or nitrile radicals
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	233/20	. . with substituted hydrocarbon radicals, directly attached to ring carbon atoms
231/16	. . . . Halogen atoms or nitro radicals	233/22	. . . Radicals substituted by oxygen atoms
231/18	. . . . One oxygen or sulfur atom	233/24	. . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
231/20	. . . . One oxygen atom attached in positions 3 or 5	233/26	. . . Radicals substituted by carbon atoms having three bonds to hetero atoms
231/22	. . . . with aryl radicals attached to ring nitrogen atoms	233/28	. . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
231/24	. . . . having sulfone or sulfonic acid radicals in the molecule	233/30	. . . Oxygen or sulfur atoms
231/26	. . . . 1-Phenyl-3-methyl-5- pyrazolones, unsubstituted or substituted on the phenyl ring	233/32	. . . . One oxygen atom
231/28	. . . . Two oxygen or sulfur atoms	233/34	. . . . ethylene-urea
231/30	. . . . attached in position 3 and 5	233/36	. . . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to ring nitrogen atoms
231/32	. . . . Oxygen atoms	233/38	. . . . with acyl radicals or hetero atoms directly attached to ring nitrogen atoms
231/34	. . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached in position 4	233/40	. . . . Two or more oxygen atoms
231/36	. . . . with hydrocarbon radicals, substituted by hetero atoms, attached in position 4	233/42	. . . . Sulfur atoms
231/38	. . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 231/16</a> )	233/44	. . . Nitrogen atoms not forming part of a nitro radical
231/40	. . . . Acylated on said nitrogen atom	233/46	. . . . with only hydrogen atoms attached to said nitrogen atoms
231/42	. . . . Benzene-sulfonamido pyrazoles	233/48	. . . . with acyclic hydrocarbon or substituted acyclic hydrocarbon radicals, attached to said nitrogen atoms
231/44	. . . . Oxygen and nitrogen or sulfur and nitrogen atoms	233/50	. . . . with carbocyclic radicals directly attached to said nitrogen atoms
231/46	. . . . Oxygen atom in position 3 or 5 and nitrogen atom in position 4	233/52	. . . . with hetero atoms directly attached to said nitrogen atoms
231/48	. . . . with hydrocarbon radicals attached to said nitrogen atom	233/54	. having two double bonds between ring members or between ring members and non-ring members
231/50	. . . . Acylated on said nitrogen atom	233/56	. . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to ring carbon atoms
231/52	. . . . Oxygen atom in position 3 and nitrogen atom in position 5, or <i>vice versa</i>	233/58	. . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to ring nitrogen atoms
231/54	. condensed with carbocyclic rings or ring-systems	233/60	. . . with hydrocarbon radicals, substituted by oxygen or sulfur atoms, attached to ring nitrogen atoms
231/56	. . Benzopyrazoles; Hydrogenated benzopyrazoles	233/61	. . . with hydrocarbon radicals, substituted by nitrogen atoms not forming part of a nitro radical, attached to ring nitrogen atoms
<b>233/00</b>	<b>Heterocyclic compounds containing 1,3-diazole or hydrogenated 1,3-diazole rings, not condensed with other rings</b>	233/62	. . . with triarylmethyl radicals attached to ring nitrogen atoms ( <a href="#">triarylmethane dyes C09B 11/26</a> )
233/02	. having no double bonds between ring members or between ring members and non-ring members	233/64	. . with substituted hydrocarbon radicals attached to ring carbon atoms, e.g. histidine
233/04	. having one double bond between ring members or between a ring member and a non-ring member	233/66	. . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
233/06	. . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms	233/68	. . . Halogen atoms
233/08	. . . with alkyl radicals, containing more than four carbon atoms, directly attached to ring carbon atoms	233/70	. . . One oxygen atom
233/10	. . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring nitrogen atoms	233/72	. . . Two oxygen atoms, e.g. hydantoin
233/12	. . . . with substituted hydrocarbon radicals attached to ring nitrogen atoms		
233/14	. . . . Radicals substituted by oxygen atoms		

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



- 239/28 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, directly attached to ring carbon atoms
- 239/30 . . . . Halogen atoms or nitro radicals
- 239/32 . . . . One oxygen, sulfur or nitrogen atom
- 239/34 . . . . . One oxygen atom
- 239/36 . . . . . as doubly bound atom or as unsubstituted hydroxy radical
- 239/38 . . . . . One sulfur atom
- 239/40 . . . . . as doubly bound sulfur atom or as unsubstituted mercapto radical
- 239/42 . . . . . One nitrogen atom ([nitro radicals C07D 239/30](#); [benzenesulfonamido-pyrimidines C07D 239/69](#))
- 239/46 . . . . . Two or more oxygen, sulfur or nitrogen atoms ([benzenesulfonamido-pyrimidines C07D 239/69](#))
- 239/47 . . . . . One nitrogen atom and one oxygen or sulfur atom, e.g. cytosine
- 239/48 . . . . . Two nitrogen atoms
- 239/49 . . . . . with an aralkyl radical, or substituted aralkyl radical, attached in position 5, e.g. trimethoprim
- 239/50 . . . . . Three nitrogen atoms
- 239/52 . . . . . Two oxygen atoms
- 239/54 . . . . . as doubly bound oxygen atoms or as unsubstituted hydroxy radicals
- 239/545 . . . . . with other hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, directly attached to ring carbon atoms
- 239/553 . . . . . with halogen atoms or nitro radicals directly attached to ring carbon atoms, e.g. fluorouracil
- 239/557 . . . . . with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, directly attached to ring carbon atoms, e.g. orotic acid
- 239/56 . . . . . One oxygen atom and one sulfur atom
- 239/58 . . . . . Two sulfur atoms
- 239/60 . . . . . Three or more oxygen or sulfur atoms
- 239/62 . . . . . Barbituric acids
- 239/64 . . . . . Salts of organic bases; Organic double compounds
- 239/66 . . . . . Thiobarbituric acids
- 239/68 . . . . . Salts or organic bases; Organic double compounds
- 239/69 . . . . Benzenesulfonamido-pyrimidines
- 239/70 . condensed with carbocyclic rings or ring systems
- 239/72 . . Quinazolines; Hydrogenated quinazolines
- 239/74 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to ring carbon atoms of the hetero ring
- 239/76 . . . . N-oxides
- 239/78 . . . with hetero atoms directly attached in position 2
- 239/80 . . . . Oxygen atoms
- 239/82 . . . . with an aryl radical attached in position 4
- 239/84 . . . . Nitrogen atoms
- 239/86 . . . with hetero atoms directly attached in position 4

- 239/88 . . . . Oxygen atoms
- 239/90 . . . . . with acyclic radicals attached in positions 2 or 3
- 239/91 . . . . . with aryl or aralkyl radicals attached in positions 2 or 3
- 239/92 . . . . . with hetero atoms directly attached to nitrogen atoms of the hetero ring
- 239/93 . . . . Sulfur atoms
- 239/94 . . . . Nitrogen atoms
- 239/95 . . . with hetero atoms directly attached in position 2 and 4
- 239/96 . . . . Two oxygen atoms
- 241/00 Heterocyclic compounds containing 1,4-diazine or hydrogenated 1,4-diazine rings**
- NOTE**
- Piperazines with only hydrogen atoms directly attached to ring carbon atoms are classified in group [C07D 295/00](#)**
- 241/02 . not condensed with other rings
- 241/04 . . having no double bonds between ring members or between ring members and non-ring members
- 241/06 . . having one or two double bonds between ring members or between ring members and non-ring members
- 241/08 . . . with oxygen atoms directly attached to ring carbon atoms
- 241/10 . . having three double bonds between ring members or between ring members and non-ring members
- 241/12 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 241/14 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 241/16 . . . . Halogen atoms; Nitro radicals
- 241/18 . . . . Oxygen or sulfur atoms
- 241/20 . . . . Nitrogen atoms ([nitro radicals C07D 241/16](#))
- 241/22 . . . . . Benzenesulfonamido pyrazines
- 241/24 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 241/26 . . . . . with nitrogen atoms directly attached to ring carbon atoms
- 241/28 . . . . . in which said hetero-bound carbon atoms have double bonds to oxygen, sulfur or nitrogen atoms
- 241/30 . . . . . in which said hetero-bound carbon atoms are part of a substructure - C(=X)-X-C(=X)-X- in which X is an oxygen or sulfur atom or an imino radical, e.g. imidoylguanidines
- 241/32 . . . . . (Amino-pyrazinoyl) guanidines
- 241/34 . . . . . (Amino-pyrazine carbonamido) guanidines [2,5]
- 241/36 . condensed with carbocyclic rings or ring systems
- 241/38 . . with only hydrogen or carbon atoms directly attached to the ring nitrogen atoms
- 241/40 . . . Benzopyrazines
- 241/42 . . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the hetero ring

- 241/44 . . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the hetero ring
- 241/46 . . . Phenazines
- 241/48 . . . . with hydrocarbon radicals, substituted by nitrogen atoms, directly attached to the ring nitrogen atoms
- 241/50 . . with hetero atoms directly attached to ring nitrogen atoms
- 241/52 . . . Oxygen atoms
- 241/54 . . . Nitrogen atoms

**243/00 Heterocyclic compounds containing seven-membered rings having two nitrogen atoms as the only ring hetero atoms**

- 243/02 . having the nitrogen atoms in positions 1,2
- 243/04 . having the nitrogen atoms in positions 1,3
- 243/06 . having the nitrogen atoms in positions 1,4
- 243/08 . . not condensed with other rings
- 243/10 . . condensed with carbocyclic rings or ring systems
- 243/12 . . . 1,5-Benzodiazepines; Hydrogenated 1,5-benzodiazepines
- 243/14 . . . 1,4-Benzodiazepines; Hydrogenated 1,4-benzodiazepines
- 243/16 . . . . substituted in position 5 by aryl radicals
- 243/18 . . . . substituted in position 2 by nitrogen, oxygen or sulfur atoms
- 243/20 . . . . . Nitrogen atoms
- 243/22 . . . . . Sulfur atoms
- 243/24 . . . . . Oxygen atoms
- 243/26 . . . . . Preparation from compounds already containing the benzodiazepine skeleton
- 243/28 . . . . . Preparation including building-up the benzodiazepine skeleton from compounds containing no hetero rings
- 243/30 . . . . . Preparation including building-up the benzodiazepine skeleton from compounds already containing hetero rings
- 243/32 . . . . . containing a phthalimide or hydrogenated phthalimide ring system
- 243/34 . . . . . containing a quinazoline or hydrogenated quinazoline ring system
- 243/36 . . . . . containing an indole or hydrogenated indole ring system
- 243/38 . . . [b, e]- or [b, f]-condensed with six-membered rings

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

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

**247/00 Heterocyclic compounds containing rings having two nitrogen atoms as the only ring hetero atoms, according to more than one of groups C07D 229/00 - C07D 245/00**

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

**249/00**

249/02

249/04

249/06

249/08

249/10

249/12

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249/16

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**251/00**

251/02

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251/42

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251/46

251/48

251/50

251/52

251/54

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

- . not condensed with other rings
- . . 1,2,3-Triazoles; Hydrogenated 1,2,3-triazoles
- . . . with aryl radicals directly attached to ring atoms
- . . 1,2,4-Triazoles; Hydrogenated 1,2,4-triazoles
- . . . 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
- . . . . Oxygen or sulfur atoms
- . . . . Nitrogen atoms
- . condensed with carbocyclic rings or ring systems
- . . Benzotriazoles
- . . . with aryl radicals directly attached in position 2
- . . Naphthotriazoles
- . . . with stilbene radicals attached in position 2

**Heterocyclic compounds containing 1,3,5-triazine rings**

- . not condensed with other rings
- . . having no double bonds between ring members or between ring members and non-ring members
- . . . with hetero atoms directly attached to ring nitrogen atoms
- . . having one double bond between ring members or between a ring member and a non-ring member
- . . having two double bonds between ring members or between ring members and non-ring members
- . . having three double bonds between ring members or between ring members and non-ring members
- . . . with hydrogen or carbon atoms directly attached to at least one ring carbon atom
- . . . . to only one ring carbon atom
- . . . . with nitrogen atoms directly attached to the two other ring carbon atoms, e.g. guanamines
- . . . . with no nitrogen atoms directly attached to a ring carbon atom
- . . . . to two ring carbon atoms
- . . . . to three ring carbon atoms
- . . . with only hetero atoms directly attached to ring carbon atoms
- . . . . Only halogen atoms, e.g. cyanuric chloride
- . . . . Only oxygen atoms
- . . . . Cyanuric acid; Isocyanuric acid
- . . . . Cyanuric or isocyanuric esters
- . . . . having halogen atoms directly attached to ring nitrogen atoms
- . . . . Sulfur atoms
- . . . . Nitrogen atoms
- . . . . . One nitrogen atom
- . . . . . with halogen atoms attached to the two other ring carbon atoms
- . . . . . with oxygen or sulfur atoms attached to the two other ring carbon atoms
- . . . . . Two nitrogen atoms
- . . . . . with a halogen atom attached to the third ring carbon atom
- . . . . . with an oxygen or sulfur atom attached to the third ring carbon atom
- . . . . . Three nitrogen atoms

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

263/46	. . . . Sulfur atoms	267/08	. . having the hetero atoms in positions 1 and 4
263/48	. . . . Nitrogen atoms not forming part of a nitro radical	267/10	. . . not condensed with other rings
263/50	. . . . Benzene-sulphonamido oxazoles	267/12	. . . condensed with carbocyclic rings or ring systems
263/52	. condensed with carbocyclic rings or ring systems	267/14	. . . . condensed with one six-membered ring
263/54	. . Benzoxazoles; Hydrogenated benzoxazoles	267/16	. . . . condensed with two six-membered rings
263/56	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached in position 2	267/18	. . . . [b, e]-condensed
263/57	. . . . Aryl or substituted aryl radicals	267/20	. . . . [b, f]-condensed
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	267/22	. Eight-membered rings
263/60	. . Naphthoxazoles; Hydrogenated naphthoxazoles	<b>269/00</b>	<b>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 <a href="#">C07D 261/00</a> - <a href="#">C07D 267/00</a></b>
263/62	. . having two or more ring systems containing condensed 1,3-oxazole rings	269/02	. having the hetero atoms in positions 1 and 3
263/64	. . . linked in positions 2 and 2' by chains containing six-membered aromatic rings or ring systems containing such rings	<b>271/00</b>	<b>Heterocyclic compounds containing five-membered rings having two nitrogen atoms and one oxygen atom as the only ring hetero atoms</b>
<b>265/00</b>	<b>Heterocyclic compounds containing six-membered rings having one nitrogen atom and one oxygen atom as the only ring hetero atoms</b>	271/02	. not condensed with other rings
	<b>NOTE</b>	271/04	. . 1,2,3-Oxadiazoles; Hydrogenated 1,2,3-oxadiazoles
	Morpholines having only hydrogen atoms attached to the ring carbon atoms are classified in <a href="#">C07D 295/00</a>	271/06	. . 1,2,4-Oxadiazoles; Hydrogenated 1,2,4-oxadiazoles
265/02	. 1,2-Oxazines; Hydrogenated 1,2-oxazines	271/07	. . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical
265/04	. 1,3-Oxazines; Hydrogenated 1,3-oxazines	271/08	. . 1,2,5-Oxadiazoles; Hydrogenated 1,2,5-oxadiazoles
265/06	. . not condensed with other rings	271/10	. . 1,3,4-Oxadiazoles; Hydrogenated 1,3,4-oxadiazoles
265/08	. . . having one double bond between ring members or between a ring member and a non-ring member	271/107	. . . with two aryl or substituted aryl radicals attached in positions 2 and 5
265/10	. . . . with oxygen atoms directly attached to ring carbon atoms	271/113	. . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical
265/12	. . condensed with carbocyclic rings or ring systems	271/12	. condensed with carbocyclic rings or ring systems
265/14	. . . condensed with one six-membered ring	<b>273/00</b>	<b>Heterocyclic compounds containing rings having nitrogen and oxygen atoms as the only ring hetero atoms, not provided for by groups <a href="#">C07D 261/00</a> - <a href="#">C07D 271/00</a></b>
265/16	. . . . with only hydrogen or carbon atoms directly attached in positions 2 and 4	273/01	. having one nitrogen atom
265/18	. . . . with hetero atoms directly attached in position 2	273/02	. having two nitrogen atoms and only one oxygen atom
265/20	. . . . with hetero atoms directly attached in position 4	273/04	. . Six-membered rings
265/22	. . . . . Oxygen atoms	273/06	. . Seven-membered rings
265/24	. . . . with hetero atoms directly attached in positions 2 and 4	273/08	. having two nitrogen atoms and more than one oxygen atom
265/26	. . . . . Two oxygen atoms, e.g. isatoic anhydride	<b>Heterocyclic compounds having nitrogen and sulfur as the only ring hetero atoms</b>	
265/28	. 1,4-Oxazines; Hydrogenated 1,4-oxazines	<b>275/00</b>	<b>Heterocyclic compounds containing 1,2-thiazole or hydrogenated 1,2-thiazole rings</b>
265/30	. . not condensed with other rings	275/02	. not condensed with other rings
265/32	. . . with oxygen atoms directly attached to ring carbon atoms	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
265/33	. . . . Two oxygen atoms, in positions 3 and 5	275/04	. condensed with carbocyclic rings or ring systems
265/34	. . condensed with carbocyclic rings	275/06	. . with hetero atoms directly attached to the ring sulfur atom
265/36	. . . condensed with one six-membered ring	<b>277/00</b>	<b>Heterocyclic compounds containing 1,3-thiazole or hydrogenated 1,3-thiazole rings</b>
265/38	. . . [b, e]-condensed with two six-membered rings		
<b>267/00</b>	<b>Heterocyclic compounds containing rings of more than six members having one nitrogen atom and one oxygen atom as the only ring hetero atoms</b>		
267/02	. Seven-membered rings		
267/04	. . having the hetero atoms in positions 1 and 2		
267/06	. . having the hetero atoms in positions 1 and 3		



- 277/02 . . not condensed with other rings
- 277/04 . . having no double bonds between ring members or between ring members and non-ring members
- 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
- 277/08 . . having one double bond between ring members or between a ring member and a non-ring member
- 277/10 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 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
- 277/14 . . . . Oxygen atoms
- 277/16 . . . . Sulfur atoms
- 277/18 . . . . Nitrogen atoms
- 277/20 . . having two or three double bonds between ring members or between ring members and non-ring members
- 277/22 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 277/24 . . . . Radicals substituted by oxygen atoms
- 277/26 . . . . Radicals substituted by sulfur atoms
- 277/28 . . . . Radicals substituted by nitrogen atoms
- 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
- 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
- 277/34 . . . . Oxygen atoms
- 277/36 . . . . Sulfur atoms
- 277/38 . . . . Nitrogen atoms
- 277/40 . . . . . Unsubstituted amino or imino radicals
- 277/42 . . . . . Amino or imino radicals substituted by hydrocarbon or substituted hydrocarbon radicals
- 277/44 . . . . . Acylated amino or imino radicals
- 277/46 . . . . . by carboxylic acids, or sulfur or nitrogen analogues thereof
- 277/48 . . . . . by radicals derived from carbonic acid, or sulfur or nitrogen analogues thereof, e.g. carbonylguanidines
- 277/50 . . . . . Nitrogen atoms bound to hetero atoms (nitro radicals C07D 277/58)
- 277/52 . . . . . to sulfur atoms, e.g. sulfonamides
- 277/54 . . . . Nitrogen and either oxygen or sulfur atoms
- 277/56 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 277/58 . . . . Nitro radicals
- 277/587 . . . with aliphatic hydrocarbon radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms, said aliphatic radicals being substituted in the alpha-position to the ring by a hetero atom, e.g.  $\begin{array}{c} \text{---N} \\ | \\ \text{---C---} \\ | \\ \text{S} \\ | \\ \text{Z} \end{array} \text{---}(\text{CH}_2)_m\text{---C}\equiv$  with m  $\geq 0$ , Z being a singly or a doubly bound hetero atom
- 277/593 . . . . Z being doubly bound oxygen or doubly bound nitrogen, which nitrogen is part of a possibly substituted oximino radical
- 277/60 . condensed with carbocyclic rings or ring-systems
- 277/62 . . Benzothiazoles
- 277/64 . . . with only hydrocarbon or substituted hydrocarbon radicals attached in position 2
- 277/66 . . . . with aromatic rings or ring systems directly attached in position 2
- 277/68 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 2
- 277/70 . . . . Sulfur atoms
- 277/72 . . . . . 2-Mercaptobenzothiazole
- 277/74 . . . . . Sulfur atoms substituted by carbon atoms
- 277/76 . . . . . Sulfur atoms attached to a second hetero atom
- 277/78 . . . . . to a sulfur atom
- 277/80 . . . . . to a nitrogen atom
- 277/82 . . . . Nitrogen atoms
- 277/84 . . Naphthothiazoles
- 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
- 279/02 . 1,2-Thiazines; Hydrogenated 1,2-thiazines
- 279/04 . 1,3-Thiazines; Hydrogenated 1,3-thiazines
- 279/06 . . not condensed with other rings
- 279/08 . . condensed with carbocyclic rings or ring systems
- 279/10 . 1,4-Thiazines; Hydrogenated 1,4-thiazines
- 279/12 . . not condensed with other rings
- 279/14 . . condensed with carbocyclic rings or ring systems
- 279/16 . . . condensed with one six-membered ring
- 279/18 . . . [b, e]-condensed with two six-membered rings
- 279/20 . . . . with hydrogen atoms directly attached to the ring nitrogen atom
- 279/22 . . . . with carbon atoms directly attached to the ring nitrogen atom
- 279/24 . . . . . with hydrocarbon radicals, substituted by amino radicals, attached to the ring nitrogen atom
- 279/26 . . . . . without other substituents attached to the ring system
- 279/28 . . . . . with other substituents attached to the ring system
- 279/30 . . . . . with acyl radicals attached to the ring nitrogen atom



279/32	. . . . with hetero atoms directly attached to the ring nitrogen atom	285/28	. . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached in position 3
279/34	. . . . with hetero atoms directly attached to the ring sulfur atom	285/30	. . . . . with hydrocarbon radicals, substituted by hetero atoms attached in position 3
279/36	. . . [b, e]-condensed, at least one with a further condensed benzene ring	285/32	. . . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 3
<b>281/00</b>	<b>Heterocyclic compounds containing rings of more than six members having one nitrogen atom and one sulfur atom as the only ring hetero atoms</b>	285/34	. . . 1,3,5-Thiadiazines; Hydrogenated 1,3,5-thiadiazines
281/02	. Seven-membered rings	285/36	. Seven-membered rings
281/04	. . having the hetero atoms in positions 1 and 4	285/38	. Eight-membered rings
281/06	. . . not condensed with other rings	<b>291/00</b>	<b>Heterocyclic compounds containing rings having nitrogen, oxygen and sulfur atoms as the only ring hetero atoms</b>
281/08	. . . condensed with carbocyclic rings or ring systems	291/02	. not condensed with other rings
281/10	. . . . condensed with one six-membered ring	291/04	. . Five-membered rings
281/12	. . . . condensed with two six-membered rings	291/06	. . Six-membered rings
281/14	. . . . . [b, e]-condensed	291/08	. condensed with carbocyclic rings or ring systems
281/16	. . . . . [b, f]-condensed	<b>293/00</b>	<b>Heterocyclic compounds containing rings having nitrogen and selenium or nitrogen and tellurium, with or without oxygen or sulfur atoms, as the ring hetero atoms</b>
281/18	. Eight-membered rings	293/02	. not condensed with other rings
<b>283/00</b>	<b>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 <a href="#">C07D 275/00</a> - <a href="#">C07D 281/00</a></b>	293/04	. . Five-membered rings
283/02	. having the hetero atoms in positions 1 and 3	293/06	. . . Selenazoles; Hydrogenated selenazoles
<b>285/00</b>	<b>Heterocyclic compounds containing rings having nitrogen and sulfur atoms as the only ring hetero atoms, not provided for by groups <a href="#">C07D 275/00</a> - <a href="#">C07D 283/00</a></b>	293/08	. . Six-membered rings
285/01	. Five-membered rings	293/10	. condensed with carbocyclic rings or ring systems
285/02	. . Thiadiazoles; Hydrogenated thiadiazoles	293/12	. . Selenazoles; Hydrogenated selenazoles
285/04	. . . not condensed with other rings	<b>295/00</b>	<b>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</b>
285/06	. . . . 1,2,3-Thiadiazoles; Hydrogenated 1,2,3-thiadiazoles	295/02	. containing only hydrogen and carbon atoms in addition to the ring hetero elements
285/08	. . . . 1,2,4-Thiadiazoles; Hydrogenated 1,2,4-thiadiazoles	295/023	. . Preparation; Separation; Stabilisation; Use of additives
285/10	. . . . 1,2,5-Thiadiazoles; Hydrogenated 1,2,5-thiadiazoles	295/027	. . containing only one hetero ring
285/12	. . . . 1,3,4-Thiadiazoles; Hydrogenated 1,3,4-thiadiazoles	295/03	. . . with the ring nitrogen atoms directly attached to acyclic carbon atoms
285/125	. . . . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical	295/033	. . . with the ring nitrogen atoms directly attached to carbocyclic rings
285/13	. . . . . Oxygen atoms	295/037	. . with quaternary ring nitrogen atoms
285/135	. . . . . Nitrogen atoms	295/04	. with substituted hydrocarbon radicals attached to ring nitrogen atoms
285/14	. . . condensed with carbocyclic rings or ring systems	295/06	. . substituted by halogen atoms or nitro radicals
285/15	. Six-membered rings	295/067	. . . with the ring nitrogen atoms and the substituents attached to the same carbon chain, which is not interrupted by carbocyclic rings
285/16	. . Thiadiazines; Hydrogenated thiadiazines	295/073	. . . with the ring nitrogen atoms and the substituents separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
285/18	. . . 1,2,4-Thiadiazines; Hydrogenated 1,2,4-thiadiazines	295/08	. . substituted by singly bound oxygen or sulfur atoms
285/20	. . . . condensed with carbocyclic rings or ring systems		
285/22	. . . . . condensed with one six-membered ring		
285/24	. . . . . with oxygen atoms directly attached to the ring sulfur atom		
285/26	. . . . . substituted in position 6 or 7 by sulfamoyl or substituted sulfamoyl radicals		

- 295/084 . . . with the ring nitrogen atoms and the oxygen or sulfur atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/088 . . . . to an acyclic saturated chain
- 295/092 . . . . with aromatic radicals attached to the chain
- 295/096 . . . with the ring nitrogen atoms and the oxygen or sulfur atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/10 . . substituted by doubly bound oxygen or sulfur atoms ([acylated ring nitrogen atoms C07D 295/16](#))
- 295/104 . . . with the ring nitrogen atoms and the doubly bound oxygen or sulfur atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/108 . . . . to an acyclic saturated chain
- 295/112 . . . with the ring nitrogen atoms and the doubly bound oxygen or sulfur atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/116 . . . . with the doubly bound oxygen or sulfur atoms directly attached to a carbocyclic ring
- 295/12 . . substituted by singly or doubly bound nitrogen atoms ([nitro radicals C07D 295/06](#))
- 295/125 . . . with the ring nitrogen atoms and the substituent nitrogen atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/13 . . . . to an acyclic saturated chain
- 295/135 . . . with the ring nitrogen atoms and the substituent nitrogen atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/14 . . substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 295/145 . . . with the ring nitrogen atoms and the carbon atoms with three bonds to hetero atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/15 . . . . to an acyclic saturated chain
- 295/155 . . . with the ring nitrogen atoms and the carbon atoms with three bonds to hetero atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/16 . . acylated on ring nitrogen atoms
- 295/18 . . by radicals derived from carboxylic acids, or sulfur or nitrogen analogues thereof
- 295/182 . . . Radicals derived from carboxylic acids
- 295/185 . . . . from aliphatic carboxylic acids
- 295/192 . . . . from aromatic carboxylic acids
- 295/194 . . . Radicals derived from thio- or thiono carboxylic acids
- 295/195 . . . Radicals derived from nitrogen analogues of carboxylic acids
- 295/20 . . by radicals derived from carbonic acid, or sulfur or nitrogen analogues thereof
- 295/205 . . . Radicals derived from carbonic acid
- 295/21 . . . Radicals derived from sulfur analogues of carbonic acid
- 295/215 . . . Radicals derived from nitrogen analogues of carbonic acid

- 295/22 . . with hetero atoms directly attached to ring nitrogen atoms
- 295/24 . . Oxygen atoms
- 295/26 . . Sulfur atoms
- 295/28 . . Nitrogen atoms
- 295/30 . . . non-acylated
- 295/32 . . . acylated with carboxylic or carbonic acids, or their nitrogen or sulfur analogues

**Heterocyclic compounds having oxygen atoms with or without sulfur, selenium or tellurium, as ring hetero atoms**

**301/00 Preparation of oxiranes**

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

**303/00 Compounds containing three-membered rings having one oxygen atom as the only ring heteroatom**

- 303/02 . Compounds containing oxirane rings
- 303/04 . . containing only hydrogen and carbon atoms in addition to the ring oxygen atoms
  - 303/06 . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings
- 303/08 . . with hydrocarbon radicals, substituted by halogen atoms, nitro radicals or nitroso radicals
  - 303/10 . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings ([steroids C07J](#))
- 303/12 . . with hydrocarbon radicals substituted by singly or doubly bound oxygen atoms
  - 303/14 . . . by free hydroxyl radicals
  - 303/16 . . . by esterified hydroxyl radicals
  - 303/17 . . . . containing oxirane rings condensed with carbocyclic ring systems having three or more relevant rings
  - 303/18 . . . by etherified hydroxyl radicals

- 303/20 . . . . Ethers with hydroxy compounds containing no oxirane rings
- 303/22 . . . . . with monohydroxy compounds
- 303/23 . . . . . Oxiranylmethyl ethers of compounds having one hydroxy group bound to a six-membered aromatic ring, the oxiranylmethyl radical not being further substituted, i.e.
- $$\begin{array}{c} \text{CH}_2-\text{CH}-\text{CH}_2-\text{O}-\text{Aryl} \\ \diagup \quad \diagdown \\ \text{O} \end{array}$$
- 303/24 . . . . . with polyhydroxy compounds
- 303/26 . . . . . having one or more free hydroxyl radicals
- 303/27 . . . . . having all hydroxyl radicals etherified with oxirane containing compounds
- 303/28 . . . . Ethers with hydroxy compounds containing oxirane rings
- 303/30 . . . . . ethers of oxirane-containing polyhydroxy compounds in which all hydroxyl radicals are etherified with oxirane-containing hydroxy compounds
- 303/31 . . . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings
- 303/32 . . . by aldehyde- or ketonic radicals
- 303/34 . . with hydrocarbon radicals substituted by sulfur, selenium or tellurium atoms
- 303/36 . . with hydrocarbon radicals substituted by nitrogen atoms ([nitro, nitroso radicals C07D 303/08](#))
- 303/38 . . with hydrocarbon radicals substituted by carbon atoms having three bonds to heteroatoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 303/40 . . . by ester radicals
- 303/42 . . . . Acyclic compounds having a chain of seven or more carbon atoms, e.g. epoxidised fats
- 303/44 . . . . Esterified with oxirane-containing hydroxy compounds
- 303/46 . . . by amide or nitrile radicals
- 303/48 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms; with at the most one bond to halogen, directly attached to ring carbon atoms, e.g. ester or nitrile radicals
- 305/00 Heterocyclic compounds containing four-membered rings having one oxygen atom as the only ring hetero atom**
- 305/02 . not condensed with other rings
- 305/04 . . having no double bonds between ring members or between ring members and non-ring members
- 305/06 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring atoms
- 305/08 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring atoms
- 305/10 . . having one or more double bonds between ring members or between ring members and non-ring members
- 305/12 . . . Beta-lactones
- 305/14 . condensed with carbocyclic rings or ring systems

- 307/00 Heterocyclic compounds containing five-membered rings having one oxygen atom as the only ring hetero atom**
- 307/02 . not condensed with other rings
- 307/04 . . having no double bonds between ring members or between ring members and non-ring members
- 307/06 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- 307/08 . . . . Preparation of tetrahydrofuran
- 307/10 . . . with substituted hydrocarbon radicals attached to ring carbon atoms
- 307/12 . . . . Radicals substituted by oxygen atoms
- 307/14 . . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
- 307/16 . . . . Radicals substituted by carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals
- 307/18 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 307/20 . . . . Oxygen atoms
- 307/22 . . . . Nitrogen atoms not forming part of a nitro radical
- 307/24 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 307/26 . . having one double bond between ring members or between a ring member and a non-ring member
- 307/28 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 307/30 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 307/32 . . . . Oxygen atoms
- 307/33 . . . . . in position 2, the oxygen atom being in its keto or unsubstituted enol form
- 307/34 . . having two or three double bonds between ring members or between ring members and non-ring members
- 307/36 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- 307/38 . . . with substituted hydrocarbon radicals attached to ring carbon atoms
- 307/40 . . . . Radicals substituted by oxygen atoms
- 307/42 . . . . . Singly bound oxygen atoms ([two oxygen atoms bound to the same carbon atom C07D 307/46](#))
- 307/44 . . . . . Furfuryl alcohol
- 307/45 . . . . . Oxygen atoms acylated by a cyclopropane containing carboxylic acyl radical, e.g. chrysanthemumates
- 307/46 . . . . . Doubly bound oxygen atoms, or two oxygen atoms singly bound to the same carbon atom
- 307/48 . . . . . Furfural
- 307/50 . . . . . Preparation from natural products
- 307/52 . . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical

307/54	. . . . Radicals substituted by carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals	307/935	. . . . Not further condensed cyclopenta [b] furans or hydrogenated cyclopenta [b] furans
307/56	. . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms	307/937	. . . . with hydrocarbon or substituted hydrocarbon radicals directly attached in position 2, e.g. prostacyclins
307/58	. . . . One oxygen atom, e.g. butenolide	307/94	. . . . spiro-condensed with carbocyclic rings or ring systems, e.g. griseofulvins
307/60	. . . . Two oxygen atoms, e.g. succinic anhydride	<b>309/00</b>	<b>Heterocyclic compounds containing six-membered rings having one oxygen atom as the only ring hetero atom, not condensed with other rings</b>
307/62	. . . . Three oxygen atoms, e.g. ascorbic acid	309/02	. . . . having no double bonds between ring members or between ring members and non-ring members
307/64	. . . . Sulfur atoms	309/04	. . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
307/66	. . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 307/70</a> )	309/06	. . . . Radicals substituted by oxygen atoms
307/68	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	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
307/70	. . . . Nitro radicals	309/10	. . . . Oxygen atoms
307/71	. . . . . attached in position 5	309/12	. . . . Only hydrogen atoms and one oxygen atom directly attached to ring carbon atoms, e.g. tetrahydropyranyl ethers
307/72	. . . . . with hydrocarbon radicals, substituted by nitrogen-containing radicals, attached in position 2	309/14	. . . . Nitrogen atoms not forming part of a nitro radical ( <a href="#">nitro radical C07D 309/08</a> )
307/73	. . . . . by amino or imino, or substituted amino or imino radicals	309/16	. . . . having one double bond between ring members or between a ring member and a non-ring member
307/74	. . . . . by hydrazino or hydrazono or such substituted radicals	309/18	. . . . containing only hydrogen and carbon atoms in addition to the ring hetero atom
307/75	. . . . . having carboxylic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. hydrazides	309/20	. . . . with hydrogen atoms and substituted hydrocarbon radicals directly attached to ring carbon atoms
307/76	. . . . . having carbonic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. semicarbazides	309/22	. . . . Radicals substituted by oxygen atoms
307/77	. . . . . ortho- or peri-condensed with carbocyclic rings or ring systems	309/24	. . . . . Methylol radicals
307/78	. . . . Benzo [b] furans; Hydrogenated benzo [b] furans	309/26	. . . . . Carboxaldehyde radicals
307/79	. . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals directly attached to carbon atoms of the hetero ring	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
307/80	. . . . Radicals substituted by oxygen atoms	309/30	. . . . Oxygen atoms, e.g. delta-lactones
307/81	. . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical	309/32	. . . . having two double bonds between ring members or between ring members and non-ring members
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	309/34	. . . . having three or more double bonds between ring members or between ring members and non-ring members
307/83	. . . . Oxygen atoms	309/36	. . . . with oxygen atoms directly attached to ring carbon atoms
307/84	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	309/38	. . . . One oxygen atom in position 2 or 4, e.g. pyrones
307/85	. . . . . attached in position 2	309/40	. . . . Oxygen atoms attached in position 3 and 4, e.g. maltol
307/86	. . . . with an oxygen atom directly attached in position 7	<b>311/00</b>	<b>Heterocyclic compounds containing six-membered rings having one oxygen atom as the only hetero atom, condensed with other rings</b>
307/87	. . . . Benzo [c] furans; Hydrogenated benzo [c] furans	311/02	. . . . ortho- or peri-condensed with carbocyclic rings or ring systems
307/88	. . . . with one oxygen atom directly attached in position 1 or 3	311/04	. . . . Benzo[b]pyrans, not hydrogenated in the carbocyclic ring
307/885	. . . . 3,3-Diphenylphthalides	311/06	. . . . with oxygen or sulfur atoms directly attached in position 2
307/89	. . . . with two oxygen atoms directly attached in positions 1 and 3	311/08	. . . . . not hydrogenated in the hetero ring
307/90	. . . . with an oxygen atom in position 1 and a nitrogen atom in position 3, or <a href="#">vice versa</a>	311/10	. . . . . unsubstituted
307/91	. . . Dibenzofurans; Hydrogenated dibenzofurans		
307/92	. . . Naphthofurans; Hydrogenated naphthofurans		
307/93	. . . condensed with a ring other than six-membered		



311/12	. . . . . substituted in position 3 and unsubstituted in position 7	311/78	. . . Ring systems having three or more relevant rings
311/14	. . . . . substituted in position 6 and unsubstituted in position 7	311/80	. . . Dibenzopyrans; Hydrogenated dibenzopyrans
311/16	. . . . . substituted in position 7	311/82	. . . . . Xanthenes
311/18	. . . . . substituted otherwise than in position 3 or 7 ( <a href="#">substituted in position 4 by oxygen or sulfur C07D 311/42</a> )	311/84	. . . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 9
311/20	. . . . . hydrogenated in the hetero ring	311/86	. . . . . Oxygen atoms, e.g. xanthenes
311/22	. . . with oxygen or sulfur atoms directly attached in position 4	311/88	. . . . . Nitrogen atoms
311/24	. . . . . with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 2	311/90	. . . . . with hydrocarbon radicals substituted by amino radicals, directly attached in position 9
311/26	. . . . . with aromatic rings attached in position 2 or 3	311/92	. . . Naphthopyrans; Hydrogenated naphthopyrans
311/28	. . . . . with aromatic rings attached in position 2 only	311/94	. . . condensed with rings other than six-membered
311/30	. . . . . not hydrogenated in the hetero ring, e.g. flavones	311/96	. . . spiro-condensed with carbocyclic rings or ring systems
311/32	. . . . . 2,3-Dihydro derivatives, e.g. flavanones	<b>313/00</b>	<b>Heterocyclic compounds containing rings of more than six members having one oxygen atom as the only ring hetero atom</b>
311/34	. . . . . with aromatic rings attached in position 3 only	313/02	. . . Seven-membered rings
311/36	. . . . . not hydrogenated in the hetero ring, e.g. isoflavones	313/04	. . . not condensed with other rings
311/38	. . . . . 2,3-Dihydro derivated, e.g. isoflavanones	313/06	. . . condensed with carbocyclic rings or ring systems
311/40	. . . . . Separation, e.g. from natural material; Purification	313/08	. . . condensed with one six-membered ring
311/42	. . . with oxygen or sulfur atoms in position 2 and 4	313/10	. . . condensed with two six-membered rings
311/44	. . . with one hydrogen atom in position 3	313/12	. . . . . [b,e]-condensed
311/46	. . . . . unsubstituted in the carbocyclic ring	313/14	. . . . . [b,f]-condensed
311/48	. . . . . with two such benzopyran radicals linked together by a carbon chain	313/16	. . . Eight-membered rings
311/50	. . . . . with elements other than carbon and hydrogen in position 3	313/18	. . . not condensed with other rings
311/52	. . . . . Enol-esters or -ethers, or sulfur analogues thereof	313/20	. . . condensed with carbocyclic rings or ring systems
311/54	. . . . . substituted in the carbocyclic ring	<b>315/00</b>	<b>Heterocyclic compounds containing rings having one oxygen atom as the only ring hetero atom according to more than one of groups <a href="#">C07D 303/00</a> - <a href="#">C07D 313/00</a></b>
311/56	. . . . . without hydrogen atoms in position 3	<b>317/00</b>	<b>Heterocyclic compounds containing five-membered rings having two oxygen atoms as the only ring hetero atoms</b>
311/58	. . . other than with oxygen or sulfur atoms in positions 2 or 4	317/02	. . . having the hetero atoms in positions 1 and 2
311/60	. . . . . with aryl radicals attached in position 2	317/04	. . . not condensed with other rings
311/62	. . . . . with oxygen atoms directly attached in position 3, e.g. anthocyanidins	317/06	. . . condensed with carbocyclic rings or ring systems
311/64	. . . . . with oxygen atoms directly attached in position 8	317/08	. . . having the hetero atoms in positions 1 and 3
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	317/10	. . . not condensed with other rings
311/68	. . . . . with nitrogen atoms directly attached in position 4	317/12	. . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
311/70	. . . . . with two hydrocarbon radicals attached in position 2 and elements other than carbon and hydrogen in position 6	317/14	. . . with substituted hydrocarbon radicals attached to ring carbon atoms
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	317/16	. . . . . Radicals substituted by halogen atoms or nitro radicals
311/74	. . . Benzo[b]pyrans, hydrogenated in the carbocyclic ring	317/18	. . . . . Radicals substituted by singly bound oxygen or sulfur atoms
311/76	. . . Benzo[c]pyrans	317/20	. . . . . Free hydroxyl or mercaptan
		317/22	. . . . . etherified
		317/24	. . . . . esterified
		317/26	. . . . . Radicals substituted by doubly bound oxygen or sulfur atoms or by two such atoms singly bound to the same carbon atom
		317/28	. . . . . Radicals substituted by nitrogen atoms ( <a href="#">by nitro radicals C07D 317/16</a> )



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	319/22	. . . condensed with one naphthalene or hydrogenated naphthalene ring system
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	319/24	. . . [b,e]-condensed with two six-membered rings
317/34	. . . . Oxygen atoms	<b>321/00</b>	<b>Heterocyclic compounds containing rings having two oxygen atoms as the only ring hetero atoms, not provided for by groups C07D 317/00 - C07D 319/00</b>
317/36	. . . . Alkylene carbonates; Substituted alkylene carbonates	321/02	. Seven-membered rings
317/38	. . . . Ethylene carbonate	321/04	. . not condensed with other rings
317/40	. . . . Vinylene carbonate; Substituted vinylene carbonates	321/06	. . . 1,3-Dioxepines; Hydrogenated 1,3-dioxepines
317/42	. . . . Halogen atoms or nitro radicals	321/08	. . . 1,4-Dioxepines; Hydrogenated 1,4-dioxepines
317/44	. . ortho- or peri-condensed with carbocyclic rings or ring systems	321/10	. . condensed with carbocyclic rings or ring systems
317/46	. . . condensed with one six-membered ring	321/12	. Eight-membered rings
317/48	. . . . Methylenedioxybenzenes or hydrogenated methylenedioxybenzenes unsubstituted on the hetero ring	<b>323/00</b>	<b>Heterocyclic compounds containing more than two oxygen atoms as the only ring hetero atoms</b>
317/50	. . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to atoms of the carbocyclic ring	323/02	. Five-membered rings
317/52	. . . . Radicals substituted by halogen atoms or nitro radicals	323/04	. Six-membered rings
317/54	. . . . Radicals substituted by oxygen atoms	323/06	. . trioxane
317/56	. . . . Radicals substituted by sulfur atoms	<b>325/00</b>	<b>Heterocyclic compounds containing rings having oxygen as the only ring hetero atoms according to more than one of the main groups C07D 303/00 - C07D 323/00</b>
317/58	. . . . Radicals substituted by nitrogen atoms (by nitro radicals C07D 317/52)	<b>327/00</b>	<b>Heterocyclic compounds containing rings having oxygen and sulfur atoms as the only ring hetero atoms</b>
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	327/02	. One oxygen atom and one sulfur atom
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	327/04	. . Five-membered rings
317/64	. . . . Oxygen atoms	327/06	. . Six-membered rings
317/66	. . . . Nitrogen atoms not forming part of a nitro radical	327/08	. . . [b,e]-condensed with two six-membered carbocyclic rings
317/68	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	327/10	. Two oxygen atoms and one sulfur atom, e.g. cyclic sulfates
317/70	. . . condensed with ring systems containing two or more relevant rings	<b>329/00</b>	<b>Heterocyclic compounds containing rings having oxygen and selenium or oxygen and tellurium atoms as the only ring hetero atoms</b>
317/72	. . spiro-condensed with carbocyclic rings	<b>Heterocyclic compounds having sulfur, selenium or tellurium as the only ring hetero atoms</b>	
<b>319/00</b>	<b>Heterocyclic compounds containing six-membered rings having two oxygen atoms as the only ring hetero atoms</b>	<b>331/00</b>	<b>Heterocyclic compounds containing rings of less than five members, having one sulfur atom as the only ring hetero atom</b>
319/02	. 1,2-Dioxanes; Hydrogenated 1,2-dioxanes	331/02	. Three-membered rings
319/04	. 1,3-Dioxanes; Hydrogenated 1,3-dioxanes	331/04	. Four-membered rings
319/06	. . not condensed with other rings	<b>333/00</b>	<b>Heterocyclic compounds containing five-membered rings having one sulfur atom as the only ring hetero atom</b>
319/08	. . condensed with carbocyclic rings or ring systems	333/02	. not condensed with other rings
319/10	. 1,4-Dioxanes; Hydrogenated 1,4-dioxanes	333/04	. . not substituted on the ring sulfur
319/12	. . not condensed with other rings	333/06	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring carbon atoms
319/14	. . condensed with carbocyclic rings or ring systems	333/08	. . . . Hydrogen atoms or radicals containing only hydrogen and carbon atoms
319/16	. . . condensed with one six-membered ring	333/10	. . . . Thiophene
319/18	. . . . Ethylenedioxybenzenes, not substituted on the hetero ring	333/12	. . . . Radicals substituted by halogen atoms or nitro or nitroso radicals
319/20	. . . . with substituents attached to the hetero ring	333/14	. . . . Radicals substituted by singly bound hetero atoms other than halogen
		333/16	. . . . by oxygen atoms
		333/18	. . . . by sulfur atoms

333/20	. . . . by nitrogen atoms ( <a href="#">nitro, nitroso radicals C07D 333/12</a> )	335/04	. condensed with carbocyclic rings or ring systems
333/22	. . . . Radicals substituted by doubly bound hetero atoms, or by two hetero atoms other than halogen singly bound to the same carbon atom	335/06	. . Benzothiopyrans; Hydrogenated benzothiopyrans
333/24	. . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals	335/08	. . Naphthothiopyrans; Hydrogenated naphthothiopyrans
333/26	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms	335/10	. . Dibenzotheiopyrans; Hydrogenated dibenzotheiopyrans
333/28	. . . . Halogen atoms	335/12	. . . Thioxanthenes
333/30	. . . . Hetero atoms other than halogen	335/14	. . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 9
333/32	. . . . . Oxygen atoms	335/16	. . . . . Oxygen atoms, e.g. thioxanthenes
333/34	. . . . . Sulfur atoms	335/18	. . . . . Nitrogen atoms
333/36	. . . . . Nitrogen atoms ( <a href="#">nitro, nitroso radicals C07D 333/42</a> )	335/20	. . . . with hydrocarbon radicals, substituted by amino radicals, directly attached in position 9
333/38	. . . . Carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals	<b>337/00</b>	<b>Heterocyclic compounds containing rings of more than six members having one sulfur atom as the only ring hetero atom</b>
333/40	. . . . . Thiophene-2-carboxylic acid [2]	337/02	. Seven-membered rings
333/42	. . . . with nitro or nitroso radicals directly attached to ring carbon atoms	337/04	. . not condensed with other rings
333/44	. . . . . attached in position 5	337/06	. . condensed with carbocyclic rings or ring systems
333/46	. . substituted on the ring sulfur atom	337/08	. . . condensed with one six-membered ring
333/48	. . . by oxygen atoms	337/10	. . . condensed with two six-membered rings
333/50	. condensed with carbocyclic rings or ring systems	337/12	. . . . [b,e]-condensed
333/52	. . Benzo[b]thiophenes; Hydrogenated benzo[b]thiophenes	337/14	. . . . [b,f]-condensed
333/54	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the hetero ring	337/16	. Eight-membered rings
333/56	. . . . Radicals substituted by oxygen atoms	<b>339/00</b>	<b>Heterocyclic compounds containing rings having two sulfur atoms as the only ring hetero atoms</b>
333/58	. . . . Radicals substituted by nitrogen atoms	339/02	. Five-membered rings
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	339/04	. . having the hetero atoms in position 1,2, e.g. lipoic acid
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	339/06	. . having the hetero atoms in position 1,3, e.g. cyclic dithiocarbonates
333/64	. . . . Oxygen atoms	339/08	. Six-membered rings
333/66	. . . . Nitrogen atoms not forming part of a nitro radical	<b>341/00</b>	<b>Heterocyclic compounds containing rings having three or more sulfur atoms as the only ring hetero atoms</b>
333/68	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	<b>343/00</b>	<b>Heterocyclic compounds containing rings having sulfur and selenium or sulfur and tellurium atoms as the only ring hetero atoms</b>
333/70	. . . . . attached in position 2	<b>345/00</b>	<b>Heterocyclic compounds containing rings having selenium or tellurium atoms as the only ring hetero atoms</b>
333/72	. . Benzo[c]thiophenes; Hydrogenated benzo[c]thiophenes	<b>347/00</b>	<b>Heterocyclic compounds containing rings having halogen atoms as ring hetero atoms</b>
333/74	. . Naphthothiophenes	<b>Heterocyclic compounds containing two or more hetero rings</b>	
333/76	. . Dibenzotheiophenes	<b>401/00</b>	<b>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</b>
333/78	. . condensed with rings other than six-membered or with ring systems containing such rings	401/02	. containing two hetero rings
333/80	. . . Seven-membered rings	401/04	. . directly linked by a ring-member-to-ring-member bond
<b>335/00</b>	<b>Heterocyclic compounds containing six-membered rings having one sulfur atom as the only ring hetero atom</b>	401/06	. . linked by a carbon chain containing only aliphatic carbon atoms
335/02	. not condensed with other rings	401/08	. . linked by a carbon chain containing alicyclic rings
		401/10	. . linked by a carbon chain containing aromatic rings

401/12	. . linked by a chain containing hetero atoms as chain links	409/10	. . linked by a carbon chain containing aromatic rings
401/14	. containing three or more hetero rings	409/12	. . linked by a chain containing hetero atoms as chain links
<b>403/00</b>	<b>Heterocyclic compounds containing two or more hetero rings, having nitrogen atoms as the only ring hetero atoms, not provided for by group <a href="#">C07D 401/00</a></b>	409/14	. containing three or more hetero rings
403/02	. containing two hetero rings	<b>411/00</b>	<b>Heterocyclic compounds containing two or more hetero rings, at least one ring having oxygen and sulfur atoms as the only ring hetero atoms</b>
403/04	. . directly linked by a ring-member-to-ring-member bond	411/02	. containing two hetero rings
403/06	. . linked by a carbon chain containing only aliphatic carbon atoms	411/04	. . directly linked by a ring-member-to-ring-member bond
403/08	. . linked by a carbon chain containing alicyclic rings	411/06	. . linked by a carbon chain containing only aliphatic carbon atoms
403/10	. . linked by a carbon chain containing aromatic rings	411/08	. . linked by a carbon chain containing alicyclic rings
403/12	. . linked by a chain containing hetero atoms as chain links	411/10	. . linked by a carbon chain containing aromatic rings
403/14	. containing three or more hetero rings	411/12	. . linked by a chain containing hetero atoms as chain links
<b>405/00</b>	<b>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</b>	411/14	. containing three or more hetero rings
405/02	. containing two hetero rings	<b>413/00</b>	<b>Heterocyclic compounds containing two or more hetero rings, at least one ring having nitrogen and oxygen atoms as the only ring hetero atoms</b>
405/04	. . directly linked by a ring-member-to-ring-member bond	413/02	. containing two hetero rings
405/06	. . linked by a carbon chain containing only aliphatic carbon atoms	413/04	. . directly linked by a ring-member-to-ring-member bond
405/08	. . linked by a carbon chain containing alicyclic rings	413/06	. . linked by a carbon chain containing only aliphatic carbon atoms
405/10	. . linked by a carbon chain containing aromatic rings	413/08	. . linked by a carbon chain containing alicyclic rings
405/12	. . linked by a chain containing hetero atoms as chain links	413/10	. . linked by a carbon chain containing aromatic rings
405/14	. containing three or more hetero rings	413/12	. . linked by a chain containing hetero atoms as chain links
<b>407/00</b>	<b>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 <a href="#">C07D 405/00</a></b>	413/14	. containing three or more hetero rings
407/02	. containing two hetero rings	<b>415/00</b>	<b>Heterocyclic compounds containing the thiamine skeleton</b>
407/04	. . directly linked by a ring-member-to-ring-member bond	<b>417/00</b>	<b>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 <a href="#">C07D 415/00</a></b>
407/06	. . linked by a carbon chain containing only aliphatic carbon atoms	417/02	. containing two hetero rings
407/08	. . linked by a carbon chain containing alicyclic rings	417/04	. . directly linked by a ring-member-to-ring-member bond
407/10	. . linked by a carbon chain containing aromatic rings	417/06	. . linked by a carbon chain containing only aliphatic carbon atoms
407/12	. . linked by a chain containing hetero atoms as chain links	417/08	. . linked by a carbon chain containing alicyclic rings
407/14	. containing three or more hetero rings	417/10	. . linked by a carbon chain containing aromatic rings
<b>409/00</b>	<b>Heterocyclic compounds containing two or more hetero rings, at least one ring having sulfur atoms as the only ring hetero atoms</b>	417/12	. . linked by a chain containing hetero atoms as chain links
409/02	. containing two hetero rings	417/14	. containing three or more hetero rings
409/04	. . directly linked by a ring-member-to-ring-member bond	<b>419/00</b>	<b>Heterocyclic compounds containing two or more hetero rings, at least one ring having nitrogen, oxygen, and sulfur atoms as the only ring hetero atoms</b>
409/06	. . linked by a carbon chain containing only aliphatic carbon atoms	419/02	. containing two hetero rings
409/08	. . linked by a carbon chain containing alicyclic rings	419/04	. . directly linked by a ring-member-to-ring-member bond

- 419/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 419/08 . . linked by a carbon chain containing alicyclic rings
- 419/10 . . linked by a carbon chain containing aromatic rings
- 419/12 . . linked by a chain containing hetero atoms as chain links
- 419/14 . containing three or more hetero rings
- 421/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having selenium, tellurium, or halogen atoms as ring hetero atoms**
- 421/02 . containing two hetero rings
- 421/04 . . directly linked by a ring-member-to-ring-member bond
- 421/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 421/08 . . linked by a carbon chain containing alicyclic rings
- 421/10 . . linked by a carbon chain containing aromatic rings
- 421/12 . . linked by a chain containing hetero atoms as chain links
- 421/14 . containing three or more hetero rings

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

##### **NOTES**

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

- 451/00 Heterocyclic compounds containing 8-azabicyclo [3.2.1] octane, 9-azabicyclo [3.3.1] nonane, or 3-oxa-9-azatricyclo [3.3.1.0<2,4>] nonane ring systems, e.g. tropane or granatane alkaloids, scopolamine; Cyclic acetals thereof**
- 451/02 . containing not further condensed 8-azabicyclo [3.2.1] octane or 3-oxa-9-azatricyclo [3.3.1.0<2,4>] nonane ring systems, e.g. tropane; Cyclic acetals thereof
- 451/04 . . with hetero atoms directly attached in position 3 of the 8-azabicyclo [3.2.1] octane or in position 7 of the 3-oxa-9-azatricyclo [3.3.1.0<2,4>] nonane ring system
- 451/06 . . . Oxygen atoms

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

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

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

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

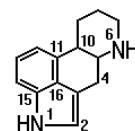
- 455/02 . containing not further condensed quinolizine ring systems
- 455/03 . containing quinolizine ring systems directly condensed with at least one six-membered carbocyclic ring, e.g. protoberberine; Alkylenedioxy derivatives of dibenzo [a, g] quinolizines, e.g. berberine

##### **WARNING**

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

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

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



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

- 457/02 . with hydrocarbon or substituted hydrocarbon radicals, attached in position 8
- 457/04 . with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 8
- 457/06 . . Lysergic acid amides
- 457/08 . . . in which the amide nitrogen is a member of a heterocyclic ring
- 457/10 . with hetero atoms directly attached in position 8
- 457/12 . . Nitrogen atoms

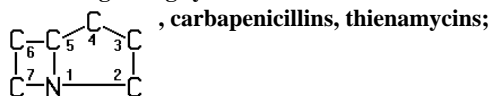


- 457/14 . containing indolo [4, 3-f, g] quinoline ring systems condensed with carbocyclic rings or ring systems
- 459/00 Heterocyclic compounds containing benz [g] indolo [2, 3-a] quinolizine ring systems, e.g. yohimbine; 16, 18-lactones thereof, e.g. reserpine acid lactone**
- 461/00 Heterocyclic compounds containing indolo [3,2,1-d,e] pyrido [3,2,1,j] [1,5]-naphthyridine ring systems, e.g. vincamine (dimeric indolo alkaloids C07D 519/04)**
- 463/00 Heterocyclic compounds containing 1-azabicyclo [4.2.0] octane ring systems, i.e. compounds containing a ring system of the formula:**
- 
- , e.g. carbacephalosporins; Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring**
- WARNING**
- The IPC subgroups of C07D 463/00, introduced in the CPC scheme in October 2007, might be temporarily incomplete as a number of documents presently classified in CPC subgroups of C07D 463/00 still needs reclassification to these IPC subgroups
- 463/02 . Preparation (by microbiological processes C12P 17/18)
- 463/04 . . by forming the ring or condensed ring systems
- 463/06 . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 463/08 . . . Modification of a carboxyl group directly attached in position 2, e.g. esterification
- 463/10 . with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 463/12 . . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals attached in position 7
- 463/14 . . with hetero atoms directly attached in position 7
- 463/16 . . . Nitrogen atoms
- 463/18 . . . further acylated by radicals derived from carboxylic acids or by nitrogen or sulfur analogues thereof
- 463/20 . . . . with the acylating radicals further substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 463/22 . . . . further substituted by nitrogen atoms
- 471/00 Heterocyclic compounds containing nitrogen atoms as the only ring hetero atoms in the condensed system, at least one ring being a six-membered ring with one nitrogen atom, not provided for by groups C07D 451/00 - C07D 463/00**
- 471/02 . in which the condensed system contains two hetero rings
- 471/04 . . Ortho-condensed systems (carbacephalosporins C07D 463/00)
- 471/06 . . Peri-condensed systems

- 471/08 . . Bridged systems
- 471/10 . . Spiro-condensed systems
- 471/12 . in which the condensed system contains three hetero rings
- 471/14 . . Ortho-condensed systems
- 471/16 . . Peri-condensed systems
- 471/18 . . Bridged systems
- 471/20 . . Spiro-condensed systems
- 471/22 . in which the condensed system contains four or more hetero rings
- 473/00 Heterocyclic compounds containing purine ring systems**
- 473/02 . with oxygen, sulfur or nitrogen atoms directly attached in positions 2 and 6
- 473/04 . . two oxygen atoms
- 473/06 . . . with radicals containing only hydrogen and carbon atoms, attached in position 1 or 3
- 473/08 . . . . with methyl radicals in positions 1 and 3, e.g. theophylline
- 473/10 . . . . with methyl radicals in positions 3 and 7, e.g. theobromine
- 473/12 . . . . with methyl radicals in positions 1, 3 and 7, e.g. caffeine
- 473/14 . . . . with two methyl radicals in positions 1 and 3 and two methyl radicals in positions 7, 8 or 9
- 473/16 . . two nitrogen atoms
- 473/18 . . one oxygen and one nitrogen atom, e.g. guanine
- 473/20 . . two sulfur atoms
- 473/22 . . one oxygen and one sulfur atom
- 473/24 . . one nitrogen and one sulfur atom
- 473/26 . with an oxygen, sulfur or nitrogen atom directly attached in position 2 or 6, but not in both
- 473/28 . . Oxygen atom
- 473/30 . . . attached in position 6, e.g. hypoxanthine
- 473/32 . . Nitrogen atom
- 473/34 . . . attached in position 6, e.g. adenine
- 473/36 . . Sulfur atom
- 473/38 . . . attached in position 6
- 473/40 . with halogen atoms or perhalogeno-alkyl radicals directly attached in positions 2 or 6
- 475/00 Heterocyclic compounds containing pteridine ring systems**
- 475/02 . with an oxygen atom directly attached in position 4
- 475/04 . . with a nitrogen atom directly attached in position 2
- 475/06 . with a nitrogen atom directly attached in position 4
- 475/08 . . with a nitrogen atom directly attached in position 2
- 475/10 . . with an aromatic or hetero-aromatic ring directly attached in position 2
- 475/12 . containing pteridine ring systems condensed with carbocyclic rings or ring systems
- 475/14 . . Benz [g] pteridines, e.g. riboflavin



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



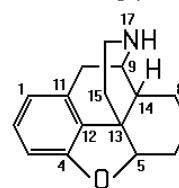
**Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring**

- 477/02 . Preparation (by [microbiological processes](#) [C12P 17/18](#))
- 477/04 . . by forming the ring or condensed ring systems
- 477/06 . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 477/08 . . . Modification of a carboxyl group directly attached in position 2, e.g. esterification
- 477/10 . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached in position 4 and with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 477/12 . . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached in position 6
- 477/14 . . . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached in position 3
- 477/16 . . . with hetero atoms or carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 3
- 477/18 . . . . Oxygen atoms
- 477/20 . . . . Sulfur atoms
- 477/22 . . . . Nitrogen atoms
- 477/24 . . with hetero atoms or carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 6
- 477/26 . with hetero atoms or carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 4

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

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

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



- 489/02 . with oxygen atoms attached in positions 3 and 6, e.g. morphine, morphinone
- 489/04 . . Salts; Organic complexes
- 489/06 . with a hetero atom directly attached in position 14
- 489/08 . . Oxygen atom
- 489/09 . containing 4aH-8, 9 c-iminoethano-phenanthro [4, 5-b, c, d] furan ring systems condensed with carbocyclic rings or ring systems
- 489/10 . . with a bridge between positions 6 and 14
- 489/12 . . . the bridge containing only two carbon atoms
- 491/00 Heterocyclic compounds containing in the condensed ring system both one or more rings having oxygen atoms as the only ring hetero atoms and one or more rings having nitrogen atoms as the only ring hetero atoms, not provided for by groups [C07D 451/00](#) - [C07D 459/00](#), [C07D 463/00](#), [C07D 477/00](#) or [C07D 489/00](#)**
- 491/02 . in which the condensed system contains two hetero rings
- 491/04 . . Ortho-condensed systems
- 491/044 . . . with only one oxygen atom as ring hetero atom in the oxygen-containing ring
- 491/048 . . . . the oxygen-containing ring being five-membered
- 491/052 . . . . the oxygen-containing ring being six-membered
- 491/056 . . . with two or more oxygen atoms as ring hetero atoms in the oxygen-containing ring
- 491/06 . . Peri-condensed systems
- 491/08 . . Bridged systems
- 491/10 . . Spiro-condensed systems
- 491/107 . . . with only one oxygen atom as ring hetero atom in the oxygen-containing ring
- 491/113 . . . with two or more oxygen atoms as ring hetero atoms in the oxygen-containing ring
- 491/12 . in which the condensed system contains three hetero rings
- 491/14 . . Ortho-condensed systems ([alkylenedioxy derivatives of dibenzo \[a, g\] quinolizines](#), e.g. berberine, [C07D 455/03](#))
- 491/147 . . . the condensed system containing one ring with oxygen as ring hetero atom and two rings with nitrogen as ring hetero atom
- 491/153 . . . the condensed system containing two rings with oxygen as ring hetero atom and one ring with nitrogen as ring hetero atom
- 491/16 . . Peri-condensed systems
- 491/18 . . Bridged systems ([3-oxa-9-azatricyclo \[3.3.1.0<2,4>\] nonane ring systems](#), e.g. scopolamine, [C07D 451/00](#))
- 491/20 . . Spiro-condensed systems
- 491/22 . in which the condensed system contains four or more hetero rings

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

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

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

- 495/02 . in which the condensed system contains two hetero rings
- 495/04 . . Ortho-condensed systems
- 495/06 . . Peri-condensed systems
- 495/08 . . Bridged systems
- 495/10 . . Spiro-condensed systems
- 495/12 . in which the condensed system contains three hetero rings
- 495/14 . . Ortho-condensed systems
- 495/16 . . Peri-condensed systems
- 495/18 . . Bridged systems
- 495/20 . . Spiro-condensed systems
- 495/22 . in which the condensed system contains four or more hetero rings

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

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

**498/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having nitrogen and oxygen atoms as the only ring hetero atoms (4-oxa-1-azabicyclo [3.2.0] heptanes, e.g. oxapenicillins C07D 503/00; 5-oxa-1-azabicyclo [4.2.0] octanes, e.g. oxacephalosporins C07D 505/00; analogues thereof having ring oxygen atoms in other position C07D 507/00)**

- 498/02 . in which the condensed system contains two hetero rings

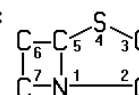
498/04  
498/06  
498/08  
498/10  
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498/14  
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498/22

**499/00**

- . . Ortho-condensed systems
- . . Peri-condensed systems
- . . Bridged systems
- . . Spiro-condensed systems
- . in which the condensed system contains three hetero rings
- . . Ortho-condensed systems
- . . Peri-condensed systems
- . . Bridged systems
- . . Spiro-condensed systems
- . in which the condensed system contains four or more hetero rings

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



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

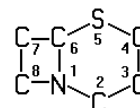
- 499/04
- 499/06 . Preparation
- 499/06 . . by forming the ring or condensed ring systems (by microbiological processes C12P 37/00)
- 499/08 . . Modification of a carboxyl radical directly attached in position 2, e.g. esterification
- 499/10 . . Modification of an amino radical directly attached in position 6
- 499/12 . . . Acylation
- 499/14 . . Preparation of salts
- 499/16 . . . of alkali or alkaline earth metals
- 499/18 . . Separation; Purification
- 499/20 . . . via salts with organic bases
- 499/21 . with a nitrogen atom directly attached in position 6 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/22 . . Salts with organic bases; Complexes with organic compounds
- 499/24 . . . with acyclic or carbocyclic compounds containing amino radicals
- 499/26 . . . with heterocyclic compounds
- 499/28 . . with modified 2-carboxyl group
- 499/30 . . . Acid anhydride
- 499/32 . . . Esters
- 499/34 . . . Thio-acid; Esters thereof
- 499/36 . . . . O-esters
- 499/38 . . . . S-esters
- 499/40 . . . Amides; Hydrazides; Azides
- 499/42 . . Compounds with a free primary amino radical attached in position 6
- 499/44 . . Compounds with an amino radical acylated by carboxylic acids, attached in position 6
- 499/46 . . . with acyclic hydrocarbon radicals or such radicals substituted by carbocyclic or heterocyclic rings, attached to the carboxamido radical
- 499/48 . . . with a carbon chain, substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, attached to the carboxamido radical

- 499/50 . . . . substituted in beta-position to the carboxamido radical
- 499/52 . . . . . by oxygen or sulfur atoms
- 499/54 . . . . . by nitrogen atoms
- 499/56 . . . . . by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 499/58 . . . . substituted in alpha-position to the carboxamido radical
- 499/60 . . . . . by oxygen atoms
- 499/62 . . . . . by sulfur atoms
- 499/64 . . . . . by nitrogen atoms
- 499/66 . . . . . with alicyclic rings as additional substituents on the carbon chain
- 499/68 . . . . . with aromatic rings as additional substituents on the carbon chain
- 499/70 . . . . . with hetero rings as additional substituents on the carbon chain
- 499/72 . . . . . by carbon atoms having three bonds to hetero atoms
- 499/74 . . . with carbocyclic rings directly attached to the carboxamido radical
- 499/76 . . . with hetero rings directly attached to the carboxamido radical
- 499/78 . . Compounds with an amino radical, acylated by carbonic acid, or by nitrogen or sulfur analogues thereof, attached in position 6
- 499/80 . . Compounds with a nitrogen-containing hetero ring, attached with the ring nitrogen atom in position 6
- 499/86 . with only atoms other than nitrogen atoms directly attached in position 6 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/861 . . with a hydrocarbon radical or a substituted hydrocarbon radical, directly attached in position 6
- 499/865 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 6
- 499/87 . Compounds being unsubstituted in position 3 or with substituents other than only two methyl radicals attached in position 3, and with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/88 . Compounds with a double bond between positions 2 and 3 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/881 . . with a hydrogen atom or an unsubstituted hydrocarbon radical, attached in position 3
- 499/883 . . with a substituted hydrocarbon radical attached in position 3
- 499/887 . . with a hetero atom or a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 3
- 499/893 . . with a hetero ring or a condensed hetero ring system, directly attached in position 3

- 499/897 . Compounds with substituents other than a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, directly attached in position 2
- 499/90 . further condensed with carbocyclic rings or ring systems

**501/00**

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



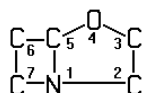
, e.g. cephalosporins;

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

- 501/02 . Preparation
- 501/04 . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 501/06 . . . Acylation of 7-aminocephalosporanic acid
- 501/08 . . by forming the ring or condensed ring systems (by microbiological processes [C12P 35/00](#))
- 501/10 . . . from compounds containing the penicillin ring system
- 501/12 . . Separation; Purification
- 501/14 . Compounds having a nitrogen atom directly attached in position 7
- 501/16 . . with a double bond between positions 2 and 3
- 501/18 . . . 7-Aminocephalosporanic or substituted 7-aminocephalosporanic acids
- 501/20 . . . 7-Acylaminocephalosporanic or substituted 7-acylaminocephalosporanic acids in which the acyl radicals are derived from carboxylic acids
- 501/22 . . . . with radicals containing only hydrogen and carbon atoms, attached in position 3
- 501/24 . . . . with hydrocarbon radicals, substituted by hetero atoms or hetero rings, attached in position 3
- 501/26 . . . . Methylene radicals, substituted by oxygen atoms; Lactones thereof with the 2-carboxyl group
- 501/28 . . . . . with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
- 501/30 . . . . . with the 7-amino-radical acylated by an araliphatic carboxylic acid
- 501/32 . . . . . with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
- 501/34 . . . . . with the 7-amino radical acylated by carboxylic acids containing hetero rings
- 501/36 . . . . Methylene radicals, substituted by sulfur atoms
- 501/38 . . . . Methylene radicals, substituted by nitrogen atoms; Lactams thereof with the 2-carboxyl group; Methylene radicals substituted by nitrogen-containing hetero rings attached by the ring nitrogen atom; Quaternary compounds thereof

- 501/40 . . . . . with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
- 501/42 . . . . . with the 7-amino radical acylated by an aliphatic carboxylic acid
- 501/44 . . . . . with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
- 501/46 . . . . . with the 7-amino radical acylated by carboxylic acids containing hetero rings
- 501/48 . . . . . Methylene radicals, substituted by hetero rings ([C07D 501/38](#) - [C07D 501/46](#) take precedence)
- 501/50 . . . . . with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
- 501/52 . . . . . with the 7-amino radical acylated by an aliphatic carboxylic acid
- 501/54 . . . . . with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
- 501/56 . . . . . with the 7-amino radical acylated by carboxylic acids containing hetero rings
- 501/57 . . . . . with a further substituent in position 7, e.g. cephamycines
- 501/58 . . . . . with a nitrogen atom, which is a member of a hetero ring, attached in position 7
- 501/59 . . . . . with hetero atoms directly attached in position 3
- 501/60 . . . . . with a double bond between positions 3 and 4
- 501/62 . . . . . Compounds further condensed with a carbocyclic ring or ring system

**503/00 Heterocyclic compounds containing 4-oxa-1-azabicyclo [3.2.0] heptane ring systems, i.e. compounds containing a ring system of the formula:**

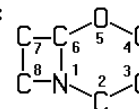


**clavulanic acid derivatives; Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring**

- 503/02 . . . . . Preparation ([by microbiological processes C12P 17/18](#))
- 503/04 . . . . . by forming the ring or condensed ring systems
- 503/06 . . . . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 503/08 . . . . . Modification of a carboxyl group directly attached in position 2, e.g. esterification
- 503/10 . . . . . with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 503/12 . . . . . unsubstituted in position 6
- 503/14 . . . . . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, other than a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, attached in position 3

- 503/16 . . . . . Radicals substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical
- 503/18 . . . . . by oxygen atoms
- 503/20 . . . . . by sulfur atoms
- 503/22 . . . . . by nitrogen atoms

**505/00 Heterocyclic compounds containing 5-oxa-1-azabicyclo [4.2.0] octane ring systems, i.e. compounds containing a ring system of the formula:**



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

- 505/02 . . . . . Preparation ([by microbiological processes C12P 17/18](#))
- 505/04 . . . . . by forming the ring or condensed ring systems
- 505/06 . . . . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 505/08 . . . . . Modification of a carboxyl group directly attached in position 2, e.g. esterification
- 505/10 . . . . . with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 505/12 . . . . . substituted in position 7
- 505/14 . . . . . with hetero atoms directly attached in position 7
- 505/16 . . . . . Nitrogen atoms
- 505/18 . . . . . further acylated by radicals derived from carboxylic acids or by nitrogen or sulfur analogues thereof
- 505/20 . . . . . with the acylating radicals further substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 505/22 . . . . . further substituted by singly-bound nitrogen atoms
- 505/24 . . . . . further substituted by doubly-bound nitrogen atoms

**507/00 Heterocyclic compounds containing a condensed beta-lactam ring system, not provided for by groups [C07D 463/00](#), [C07D 477/00](#) or [C07D 499/00](#) - [C07D 505/00](#); Such ring systems being further condensed**

- 507/02 . . . . . containing 3-oxa-1-azabicyclo [3.2.0] heptane ring systems
- 507/04 . . . . . containing 2-oxa-1-azabicyclo [4.2.0] octane ring systems
- 507/06 . . . . . containing 3-oxa-1-azabicyclo [4.2.0] octane ring systems
- 507/08 . . . . . containing 4-oxa-1-azabicyclo [4.2.0] octane ring systems

**513/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having nitrogen and sulfur atoms as the only ring hetero atoms, not provided for in groups [C07D 463/00](#), [C07D 477/00](#) or [C07D 499/00](#) - [C07D 507/00](#)**

- 513/02 . in which the condensed system contains two hetero rings
- 513/04 . . Ortho-condensed systems
- 513/06 . . Peri-condensed systems
- 513/08 . . Bridged systems
- 513/10 . . Spiro-condensed systems
- 513/12 . in which the condensed system contains three hetero rings
- 513/14 . . Ortho-condensed systems
- 513/16 . . Peri-condensed systems
- 513/18 . . Bridged systems
- 513/20 . . Spiro-condensed systems
- 513/22 . in which the condensed system contains four or more hetero rings

**515/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having nitrogen, oxygen, and sulfur atoms as the only ring hetero atoms, not provided for in groups [C07D 463/00](#), [C07D 477/00](#) or [C07D 499/00](#) - [C07D 507/00](#)**

- 515/02 . in which the condensed system contains two hetero rings
- 515/04 . . Ortho-condensed systems
- 515/06 . . Peri-condensed systems
- 515/08 . . Bridged systems
- 515/10 . . Spiro-condensed systems
- 515/12 . in which the condensed system contains three hetero rings
- 515/14 . . Ortho-condensed systems
- 515/16 . . Peri-condensed systems
- 515/18 . . Bridged systems
- 515/20 . . Spiro-condensed systems
- 515/22 . in which the condensed system contains four or more hetero rings

**517/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having selenium, tellurium or halogen atoms as ring hetero atoms**

- 517/02 . in which the condensed system contains two hetero rings
- 517/04 . . Ortho-condensed systems
- 517/06 . . Peri-condensed systems
- 517/08 . . Bridged systems
- 517/10 . . Spiro-condensed systems
- 517/12 . in which the condensed system contains three hetero rings
- 517/14 . . Ortho-condensed systems
- 517/16 . . Peri-condensed systems
- 517/18 . . Bridged systems
- 517/20 . . Spiro-condensed systems
- 517/22 . in which the condensed system contains four or more hetero rings

**519/00 Heterocyclic compounds containing more than one system of two or more relevant hetero rings condensed among themselves or condensed with a common carbocyclic ring system not provided for in groups [C07D 453/00](#) or [C07D 455/00](#)**

- 519/02 . Ergot alkaloids of the cyclic peptide type
- 519/04 . Dimeric indole alkaloids, e.g. vincalucoblastine

- 519/06 . containing at least one condensed beta-lactam ring system, provided for by groups [C07D 463/00](#), [C07D 477/00](#) or [C07D 499/00](#) - [C07D 507/00](#), e.g. a penem or a cepham system

**521/00 Heterocyclic compounds containing unspecified hetero rings**

**NOTE**

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