

# CPC COOPERATIVE PATENT CLASSIFICATION

## C CHEMISTRY; METALLURGY

(NOTES omitted)

### CHEMISTRY

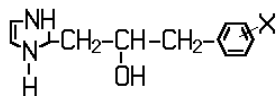
## C07 ORGANIC CHEMISTRY

(NOTES omitted)

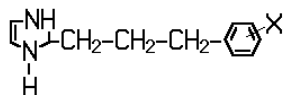
## C07D HETEROCYCLIC COMPOUNDS (macromolecular compounds C08)

### NOTES

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



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



C07D

(continued)

is classified in groups [C07D 233/24](#) and [C07D 233/26](#), where X —NH<sub>2</sub>, —NHCOCH<sub>3</sub>, or —COOCH<sub>3</sub>.**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. hydroxy carboxylic acids, lactones or 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
- 201/18 . Stabilisation

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

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

**205/00 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 bond 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

207/273

- . . . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to other ring carbon atoms

207/277	. . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals	207/456	. . . . 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 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	209/14	. . . . 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
207/448	. . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms, e.g. maleimide	209/36	. . . . . in position 3, e.g. adrenochrome
207/452	. . . . . with hydrocarbon radicals, substituted by hetero atoms, directly attached to the ring nitrogen atom	209/38	. . . . . in positions 2 and 3, e.g. isatin
		209/40	. . . . Nitrogen atoms, not forming part of a nitro radical, e.g. isatin semicarbazone
		209/42	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
		209/43	. . . with an —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
		209/46	. . . with an oxygen atom in position 1
		209/48	. . . with oxygen atoms in positions 1 and 3, e.g. phthalimide
		209/49	. . . . and having in the molecule an acyl radical containing a saturated three-membered ring, e.g. chrysanthemumic acid esters

209/50	. . . with oxygen and nitrogen atoms in positions 1 and 3	211/14	. . . . with hydrocarbon or substituted hydrocarbon radicals attached to the ring nitrogen atom
209/52	. . condensed with a ring other than six-membered	211/16	. . . . with acylated ring nitrogen atom
209/54	. . Spiro-condensed	211/18	. . . . with substituted hydrocarbon radicals attached to ring carbon atoms
209/56	. Ring systems containing three or more rings	211/20	. . . . with hydrocarbon radicals, substituted by singly bound oxygen or sulphur atoms
209/58	. . [b]- or [c]-condensed	211/22	. . . . by oxygen atoms
209/60	. . . Naphtho [b] pyrroles; Hydrogenated naphtho [b] pyrroles	211/24	. . . . by sulfur atoms to which a second hetero atom is attached
209/62	. . . Naphtho [c] pyrroles; Hydrogenated naphtho [c] pyrroles	211/26	. . . . with hydrocarbon radicals, substituted by nitrogen atoms
209/64	. . . . with an oxygen atom in position 1	211/28	. . . . to which a second hetero atom is attached
209/66	. . . . with oxygen atoms in positions 1 and 3	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
209/68	. . . . with oxygen and nitrogen atoms in positions 1 and 3	211/32	. . . . by oxygen atoms
209/70	. . . containing carbocyclic rings other than six-membered	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
209/72	. . . 4,7-Endo-alkylene-iso-indoles	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
209/74	. . . . with an oxygen atom in position 1	211/38	. . . . Halogen atoms or nitro radicals
209/76	. . . . with oxygen atoms in positions 1 and 3	211/40	. . . . Oxygen atoms
209/78	. . . . with oxygen and nitrogen atoms in positions 1 and 3	211/42	. . . . attached in position 3 or 5
209/80	. . [b, c]- or [b, d]-condensed	211/44	. . . . attached in position 4
209/82	. . . Carbazoles; Hydrogenated carbazoles	211/46	. . . . having a hydrogen atom as the second substituent in position 4
209/84	. . . . Separation, e.g. from tar; Purification	211/48	. . . . having an acyclic carbon atom attached in position 4
209/86	. . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the ring system	211/50	. . . . . Aroyl radical
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	211/52	. . . . . having an aryl radical as the second substituent in position 4
209/90	. . . Benzo [c, d] indoles; Hydrogenated benzo [c, d] indoles	211/54	. . . . Sulfur atoms
209/92	. . . . Naphthostyryls	211/56	. . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 211/38</a> )
209/94	. . . containing carbocyclic rings other than six-membered	211/58	. . . . attached in position 4
209/96	. . Spiro-condensed ring systems	211/60	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
<b>211/00</b>	<b>Heterocyclic compounds containing hydrogenated pyridine rings, not condensed with other rings</b>	211/62	. . . . attached in position 4
	<b>NOTES</b>	211/64	. . . . having an aryl radical as the second substituent in position 4
	1. In this group, the following term is used with the meaning indicated:	211/66	. . . . having a hetero atom as the second substituent in position 4
	• "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	211/72	. . . 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
211/04	. with only hydrogen or carbon atoms directly attached to the ring nitrogen atom	211/74	. . . . Oxygen atoms
211/06	. . having no double bonds between ring members or between ring members and non-ring members	211/76	. . . . attached in position 2 or 6
211/08	. . . with hydrocarbon or substituted hydrocarbon radicals directly attached to ring carbon atoms	211/78	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
211/10	. . . . with radicals containing only carbon and hydrogen atoms attached to ring carbon atoms		
211/12	. . . . with only hydrogen atoms attached to the ring nitrogen atom		

211/80	. . having two double bonds between ring members or between ring members and non-ring members	213/38	. . . . . having only hydrogen or hydrocarbon radicals attached to the substituent nitrogen atom
211/82	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	213/40	. . . . . Acylated substituent nitrogen atom
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	213/42	. . . . . having hetero atoms attached to the substituent nitrogen atom ( <a href="#">nitro radicals C07D 213/26</a> )
211/86	. . . . Oxygen atoms	213/44	. . . . Radicals substituted by doubly-bound oxygen, sulfur, or nitrogen atoms, or by two such atoms singly-bound to the same carbon atom
211/88	. . . . . attached in positions 2 and 6, e.g. glutarimide	213/46	. . . . . Oxygen atoms
211/90	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	213/48	. . . . . Aldehydo radicals
211/92	. with a hetero atom directly attached to the ring nitrogen atom	213/50	. . . . . Ketonic radicals
211/94	. . Oxygen atom, e.g. piperidine N-oxide	213/51	. . . . . Acetal radicals
211/96	. . Sulfur atom	213/52	. . . . . Sulfur atoms
211/98	. . Nitrogen atom	213/53	. . . . . Nitrogen atoms
<b>213/00</b>	<b>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</b>	213/54	. . . . 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
213/02	. having three double bonds between ring members or between ring members and non-ring members	213/55	. . . . . Acids; Esters
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	213/56	. . . . . Amides
213/06	. . . containing only hydrogen and carbon atoms in addition to the ring nitrogen atom	213/57	. . . . . Nitriles
213/08	. . . . Preparation by ring-closure	213/58	. . . . . Amidines
213/09	. . . . . involving the use of ammonia, amines, amine salts, or nitriles	213/59	. . . . . with at least one of the bonds being to sulfur
213/10	. . . . . from acetaldehyde or cyclic polymers thereof	213/60	. . . 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
213/12	. . . . . from unsaturated compounds	213/61	. . . . . Halogen atoms or nitro radicals
213/127	. . . . Preparation from compounds containing pyridine rings	213/62	. . . . . Oxygen or sulfur atoms
213/133	. . . . Preparation by dehydrogenation of hydrogenated pyridine compounds	213/63	. . . . . One oxygen atom
213/14	. . . . Preparation from compounds containing heterocyclic oxygen	213/64	. . . . . attached in position 2 or 6
213/16	. . . . containing only one pyridine ring	213/643	. . . . . 2-Phenoxypyridines; Derivatives thereof
213/18	. . . . . Salts thereof	213/647	. . . . . and having in the molecule an acyl radical containing a saturated three-membered ring, e.g. chrysanthemic acid esters
213/20	. . . . . Quaternary compounds thereof	213/65	. . . . . attached in position 3 or 5
213/22	. . . . containing two or more pyridine rings directly linked together, e.g. bipyridyl	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, sulphur, or nitrogen atom, e.g. pyridoxal
213/24	. . . with substituted hydrocarbon radicals attached to ring carbon atoms	213/67	. . . . . 2-Methyl-3-hydroxy-4,5-bis(hydroxy-methyl)pyridine, i.e. pyridoxine
213/26	. . . . Radicals substituted by halogen atoms or nitro radicals	213/68	. . . . . attached in position 4
213/28	. . . . Radicals substituted by singly-bound oxygen or sulphur atoms	213/69	. . . . . Two or more oxygen atoms
213/30	. . . . . Oxygen atoms	213/70	. . . . . Sulfur atoms
213/32	. . . . . Sulfur atoms	213/71	. . . . . to which a second hetero atom is attached
213/34	. . . . . to which a second hetero atom is attached	213/72	. . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 213/61</a> )
213/36	. . . . Radicals substituted by singly-bound nitrogen atoms ( <a href="#">nitro radicals C07D 213/26</a> )	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 bond to halogen, e.g. ester or nitrile radicals
- 213/79 . . . . . Acids; Esters
- 213/80 . . . . . in position 3
- 213/803 . . . . . Processes of preparation
- 213/807 . . . . . by oxidation of pyridines or condensed pyridines
- 213/81 . . . . . Amides; Imides
- 213/82 . . . . . in position 3
- 213/83 . . . . . Thioacids; Thioesters; Thioamides; Thioimides
- 213/84 . . . . . Nitriles
- 213/85 . . . . . in position 3
- 213/86 . . . . . Hydrazides; Thio or imino analogues thereof
- 213/87 . . . . . in position 3
- 213/88 . . . . . Nicotinoylhydrazones
- 213/89 . . with hetero atoms directly attached to the ring nitrogen atom
- 213/90 . having more than three double bonds between ring members or between ring members and non-ring members
- 215/00 Heterocyclic compounds containing quinoline or hydrogenated quinoline ring systems**
- 215/02 . having no bond between the ring nitrogen atom and a non-ring member or having only hydrogen atoms or carbon atoms directly attached to the ring nitrogen atom
- 215/04 . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to the ring carbon atoms
- 215/06 . . . having only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to the ring nitrogen atom
- 215/08 . . . with acylated ring nitrogen atom
- 215/10 . . . Quaternary compounds
- 215/12 . . with substituted hydrocarbon radicals attached to ring carbon atoms
- 215/14 . . . Radicals substituted by oxygen atoms
- 215/16 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 215/18 . . . Halogen atoms or nitro radicals
- 215/20 . . . Oxygen atoms
- 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
- 219/10 . . . attached in position 9
- 219/12 . . . . Amino-alkylamino 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
- 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-azabicyclo [3.2.2] nonanes, having only hydrogen atoms attached to the ring carbon atoms, are classified in group [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 a ring member and a non-ring member
- 231/08 . . . with oxygen or sulfur atoms directly attached to ring carbon atoms
- 231/10 . . having two or three double bonds between ring members or between ring members and non-ring members
- 231/12 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms

231/14	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms	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 position 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 positions 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
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 bond 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	233/74	. . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to other ring members
233/14	. . . . . Radicals substituted by oxygen atoms	233/76	. . . . with substituted hydrocarbon radicals attached to the third ring carbon atom
233/16	. . . . . Radicals substituted by nitrogen atoms	233/78	. . . . . Radicals substituted by oxygen atoms
233/18	. . . . . 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		



233/80	. . . . with hetero atoms or acyl radicals directly attached to ring nitrogen atoms	237/04	. . having less than three double bonds between ring members or between ring members and non-ring members
233/82	. . . . . Halogen atoms	237/06	. . having three double bonds between ring members or between ring members and non-ring members
233/84	. . . Sulfur atoms	237/08	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
233/86	. . . Oxygen and sulfur atoms, e.g. thiohydantoin	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
233/88	. . . Nitrogen atoms, e.g. allantoin	237/12	. . . . Halogen atoms or nitro radicals
233/90	. . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals	237/14	. . . . Oxygen atoms
233/91	. . . Nitro radicals	237/16	. . . . . Two oxygen atoms
233/92	. . . . attached in position 4 or 5	237/18	. . . . Sulfur atoms
233/93	. . . . . with hydrocarbon radicals, substituted by halogen atoms, attached to other ring members	237/20	. . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 237/12</a> )
233/94	. . . . . with hydrocarbon radicals, substituted by oxygen or sulfur atoms, attached to other ring members	237/22	. . . . Nitrogen and oxygen atoms
233/95	. . . . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to other ring members	237/24	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
233/96	. having three double bonds between ring members or between ring members and non-ring members	237/26	. condensed with carbocyclic rings or ring systems
<b>235/00</b>	<b>Heterocyclic compounds containing 1,3-diazole or hydrogenated 1,3-diazole rings, condensed with other rings</b>	237/28	. . Cinnolines
235/02	. condensed with carbocyclic rings or ring systems	237/30	. . Phthalazines
235/04	. . Benzimidazoles; Hydrogenated benzimidazoles	237/32	. . . with oxygen atoms directly attached to carbon atoms of the nitrogen-containing ring
235/06	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached in position 2	237/34	. . . with nitrogen atoms directly attached to carbon atoms of the nitrogen-containing ring, e.g. hydrazine radicals
235/08	. . . . Radicals containing only hydrogen and carbon atoms	237/36	. . Benzo-cinnolines
235/10	. . . . Radicals substituted by halogen atoms or nitro radicals	<b>239/00</b>	<b>Heterocyclic compounds containing 1,3-diazine or hydrogenated 1,3-diazine rings</b>
235/12	. . . . Radicals substituted by oxygen atoms	239/02	. not condensed with other rings
235/14	. . . . Radicals substituted by nitrogen atoms ( <a href="#">by nitro radicals C07D 235/10</a> )	239/04	. . having no double bonds between ring members or between ring members and non-ring members
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	239/06	. . having one double bond between ring members or between a ring member and a non-ring member
235/18	. . . with aryl radicals directly attached in position 2	239/08	. . . with hetero atoms directly attached in position 2
235/20	. . . Two benzimidazolyl-2 radicals linked together directly or via a hydrocarbon or substituted hydrocarbon radical	239/10	. . . . Oxygen or sulfur atoms
235/22	. . . with hetero atoms directly attached to ring nitrogen atoms ( <a href="#">C07D 235/10 takes precedence</a> )	239/12	. . . . Nitrogen atoms not forming part of a nitro radical
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	239/14	. . . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to said nitrogen atoms
235/26	. . . . Oxygen atoms	239/16	. . . . . acylated on said nitrogen atoms
235/28	. . . . Sulfur atoms	239/18	. . . . . with hetero atoms attached to said nitrogen atoms, except nitro radicals, e.g. hydrazine radicals
235/30	. . . . Nitrogen atoms not forming part of a nitro radical	239/20	. . having two double bonds between ring members or between ring members and non-ring members
235/32	. . . . . Benzimidazole-2-carbamic acids, unsubstituted or substituted; Esters thereof; Thio-analogues thereof	239/22	. . . with hetero atoms directly attached to ring carbon atoms
<b>237/00</b>	<b>Heterocyclic compounds containing 1,2-diazine or hydrogenated 1,2-diazine rings</b>	239/24	. . having three or more double bonds between ring members or between ring members and non-ring members
237/02	. not condensed with other rings	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	239/93	. . . . Sulfur atoms
239/34	. . . . . One oxygen atom	239/94	. . . . Nitrogen atoms
239/36	. . . . . as doubly bound oxygen atom or as unsubstituted hydroxy radical	239/95	. . . with hetero atoms directly attached in positions 2 and 4
239/38	. . . . . One sulfur atom	239/96	. . . . Two oxygen atoms
239/40	. . . . . as doubly bound sulfur atom or as unsubstituted mercapto radical	<b>241/00</b>	<b>Heterocyclic compounds containing 1,4-diazine or hydrogenated 1,4-diazine rings</b>
239/42	. . . . . One nitrogen atom ( <a href="#">nitro radicals C07D 239/30</a> )	<b>NOTE</b>	
239/46	. . . . Two or more oxygen, sulphur or nitrogen atoms		Piperazines with only hydrogen atoms directly attached to ring carbon atoms are classified in group <a href="#">C07D 295/00</a> .
239/47	. . . . . One nitrogen atom and one oxygen or sulfur atom, e.g. cytosine	241/02	. not condensed with other rings
239/48	. . . . . Two nitrogen atoms	241/04	. . having no double bonds between ring members or between ring members and non-ring members
239/49	. . . . . with an aralkyl radical, or substituted aralkyl radical, attached in position 5, e.g. trimethoprim	241/06	. . having one or two double bonds between ring members or between ring members and non-ring members
239/50	. . . . . Three nitrogen atoms	241/08	. . . with oxygen atoms directly attached to ring carbon atoms
239/52	. . . . . Two oxygen atoms	241/10	. . having three double bonds between ring members or between ring members and non-ring members
239/54	. . . . . as doubly bound oxygen atoms or as unsubstituted hydroxy radicals	241/12	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
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	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
239/553	. . . . . with halogen atoms or nitro radicals directly attached to ring carbon atoms, e.g. fluorouracil	241/16	. . . . Halogen atoms; Nitro radicals
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	241/18	. . . . Oxygen or sulfur atoms
239/56	. . . . . One oxygen atom and one sulfur atom	241/20	. . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 241/16</a> )
239/58	. . . . . Two sulfur atoms	241/22	. . . . . Benzenesulfonamido pyrazines
239/60	. . . . . Three or more oxygen or sulfur atoms	241/24	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
239/62	. . . . . Barbituric acids	241/26	. . . . . with nitrogen atoms directly attached to ring carbon atoms
239/64	. . . . . Salts of organic bases; Organic double compounds	241/28	. . . . . in which said hetero-bound carbon atoms have double bonds to oxygen, sulfur or nitrogen atoms
239/66	. . . . . Thiobarbituric acids	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 sulphur atom or an imino radical, e.g. imidoylguanidines
239/68	. . . . . Salts of organic bases; Organic double compounds	241/32	. . . . . (Amino-pyrazinoyl) guanidines
239/69	. . . . Benzenesulfonamido-pyrimidines	241/34	. . . . . (Amino-pyrazine carbonamido) guanidines
239/70	. condensed with carbocyclic rings or ring systems	241/36	. condensed with carbocyclic rings or ring systems
239/72	. . Quinazolines; Hydrogenated quinazolines	241/38	. . with only hydrogen or carbon atoms directly attached to the ring nitrogen atoms
239/74	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to ring carbon atoms of the hetero ring	241/40	. . . Benzopyrazines
239/76	. . . . N-oxides	241/42	. . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the hetero ring
239/78	. . . with hetero atoms directly attached in position 2	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
239/80	. . . . Oxygen atoms	241/46	. . . Phenazines
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 position 2 or 3		
239/91	. . . . . with aryl or aralkyl radicals attached in position 2 or 3		
239/92	. . . . . with hetero atoms directly attached to nitrogen atoms of the hetero ring		

241/48	. . . . with hydrocarbon radicals, substituted by nitrogen atoms, directly attached to the ring nitrogen atoms	249/06	. . . . with aryl radicals directly attached to ring atoms
241/50	. . with hetero atoms directly attached to ring nitrogen atoms	249/08	. . 1,2,4-Triazoles; Hydrogenated 1,2,4-triazoles
241/52	. . . Oxygen atoms	249/10	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
241/54	. . . Nitrogen atoms		
<b>243/00</b>	<b>Heterocyclic compounds containing seven-membered rings having two nitrogen atoms as the only ring hetero atoms</b>	249/12	. . . . Oxygen or sulfur atoms
243/02	. having the nitrogen atoms in positions 1 and 2	249/14	. . . . Nitrogen atoms
243/04	. having the nitrogen atoms in positions 1 and 3	249/16	. condensed with carbocyclic rings or ring systems
243/06	. having the nitrogen atoms in positions 1 and 4	249/18	. . Benzotriazoles
243/08	. . not condensed with other rings	249/20	. . . with aryl radicals directly attached in position 2
243/10	. . condensed with carbocyclic rings or ring systems	249/22	. . Naphthotriazoles
243/12	. . . 1,5-Benzodiazepines; Hydrogenated 1,5-benzodiazepines	249/24	. . . with stilbene radicals directly attached in position 2
243/14	. . . 1,4-Benzodiazepines; Hydrogenated 1,4-benzodiazepines	<b>251/00</b>	<b>Heterocyclic compounds containing 1,3,5-triazine rings</b>
243/16	. . . . substituted in position 5 by aryl radicals	251/02	. not condensed with other rings
243/18	. . . . substituted in position 2 by nitrogen, oxygen or sulfur atoms	251/04	. . having no double bonds between ring members or between ring members and non-ring members
243/20	. . . . . Nitrogen atoms	251/06	. . . with hetero atoms directly attached to ring nitrogen atoms
243/22	. . . . . Sulfur atoms	251/08	. . having one double bond between ring members or between a ring member and a non-ring member
243/24	. . . . . Oxygen atoms	251/10	. . having two double bonds between ring members or between ring members and non-ring members
243/26	. . . . . Preparation from compounds already containing the benzodiazepine skeleton	251/12	. . having three double bonds between ring members or between ring members and non-ring members
243/28	. . . . . Preparation including building-up the benzodiazepine skeleton from compounds containing no hetero rings	251/14	. . . with hydrogen or carbon atoms directly attached to at least one ring carbon atom
243/30	. . . . . Preparation including building-up the benzodiazepine skeleton from compounds already containing hetero rings	251/16	. . . . to only one ring carbon atom
243/32	. . . . . containing a phthalimide or hydrogenated phthalimide ring system	251/18	. . . . . with nitrogen atoms directly attached to the two other ring carbon atoms, e.g. guanamines
243/34	. . . . . containing a quinazoline or hydrogenated quinazoline ring system	251/20	. . . . . with no nitrogen atoms directly attached to a ring carbon atom
243/36	. . . . . containing an indole or hydrogenated indole ring system	251/22	. . . . to two ring carbon atoms
243/38	. . . [b, e]- or [b, f]-condensed with six-membered rings	251/24	. . . . to three ring carbon atoms
		251/26	. . . with only hetero atoms directly attached to ring carbon atoms
<b>245/00</b>	<b>Heterocyclic compounds containing rings of more than seven members having two nitrogen atoms as the only ring hetero atoms</b>	251/28	. . . . Only halogen atoms, e.g. cyanuric chloride
245/02	. not condensed with other rings	251/30	. . . . Only oxygen atoms
245/04	. condensed with carbocyclic rings or ring systems	251/32	. . . . . Cyanuric acid; Isocyanuric acid
245/06	. . condensed with one six-membered ring	251/34	. . . . . Cyanuric or isocyanuric esters
		251/36	. . . . . having halogen atoms directly attached to ring nitrogen atoms
<b>247/00</b>	<b>Heterocyclic compounds containing rings having two nitrogen atoms as the only ring hetero atoms, according to more than one of groups <a href="#">C07D 229/00</a> - <a href="#">C07D 245/00</a></b>	251/38	. . . . Sulfur atoms
247/02	. having the nitrogen atoms in positions 1 and 3	251/40	. . . . Nitrogen atoms
		251/42	. . . . . One nitrogen atom
<b>249/00</b>	<b>Heterocyclic compounds containing five-membered rings having three nitrogen atoms as the only ring hetero atoms</b>	251/44	. . . . . with halogen atoms attached to the two other ring carbon atoms
249/02	. not condensed with other rings	251/46	. . . . . with oxygen or sulfur atoms attached to the two other ring carbon atoms
249/04	. . 1,2,3-Triazoles; Hydrogenated 1,2,3-triazoles	251/48	. . . . . Two nitrogen atoms
		251/50	. . . . . with a halogen atom attached to the third ring carbon atom
		251/52	. . . . . with an oxygen or sulfur atom attached to the third ring carbon atom
		251/54	. . . . . Three nitrogen atoms
		251/56	. . . . . Preparation of melamine
		251/58	. . . . . from cyanamide, dicyanamide or calcium cyanamide

251/60	. . . . . from urea or from carbon dioxide and ammonia	261/08	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
251/62	. . . . . Purification of melamine	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
251/64	. . . . . Condensation products of melamine with aldehydes; Derivatives thereof (polycondensation products <a href="#">C08G</a> )	261/12	. . . . Oxygen atoms
251/66	. . . . . Derivatives of melamine in which a hetero atom is directly attached to a nitrogen atom of melamine	261/14	. . . . Nitrogen atoms
251/68	. . . . . Triazinylamino stilbenes	261/16	. . . . Benzene-sulfonamido isoxazoles
251/70	. . . . . Other substituted melamines	261/18	. . . . Carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen
251/72	. condensed with carbocyclic rings or ring systems	261/20	. condensed with carbocyclic rings or ring systems
<b>253/00</b>	<b>Heterocyclic compounds containing six-membered rings having three nitrogen atoms as the only ring hetero atoms, not provided for by group <a href="#">C07D 251/00</a></b>	<b>263/00</b>	<b>Heterocyclic compounds containing 1,3-oxazole or hydrogenated 1,3-oxazole rings</b>
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
253/075	. . . . . Two hetero atoms, in positions 3 and 5	263/12	. . . . with radicals containing only hydrogen and carbon atoms
253/08	. condensed with carbocyclic rings or ring systems	263/14	. . . . with radicals substituted by oxygen atoms
253/10	. . Condensed 1,2,4-triazines; Hydrogenated condensed 1,2,4-triazines	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
<b>255/00</b>	<b>Heterocyclic compounds containing rings having three nitrogen atoms as the only ring hetero atoms, not provided for by groups <a href="#">C07D 249/00</a> - <a href="#">C07D 253/00</a></b>	263/18	. . . . Oxygen atoms
255/02	. not condensed with other rings	263/20	. . . . . attached in position 2
255/04	. condensed with carbocyclic rings or ring systems	263/22	. . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to other ring carbon atoms
<b>257/00</b>	<b>Heterocyclic compounds containing rings having four nitrogen atoms as the only ring hetero atoms</b>	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	263/28	. . . . Nitrogen atoms not forming part of a nitro radical
257/06	. . . with nitrogen atoms directly attached to the ring carbon atom	263/30	. . having two or three double bonds between ring members or between ring members and non-ring members
257/08	. . Six-membered rings	263/32	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
257/10	. condensed with carbocyclic rings or ring systems	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
257/12	. . Six-membered rings having four nitrogen atoms	263/36	. . . . One oxygen atom
<b>259/00</b>	<b>Heterocyclic compounds containing rings having more than four nitrogen atoms as the only ring hetero atoms</b>	263/38	. . . . . attached in position 2
<b><u>Heterocyclic compounds having nitrogen and oxygen as the only ring hetero atoms</u></b>		263/40	. . . . . attached in position 4
<b>261/00</b>	<b>Heterocyclic compounds containing 1,2-oxazole or hydrogenated 1,2-oxazole rings</b>	263/42	. . . . . attached in position 5
261/02	. not condensed with other rings	263/44	. . . . Two oxygen atoms
261/04	. . having one double bond between ring members or between a ring member and a non-ring member	263/46	. . . . Sulfur atoms
261/06	. . having two or more double bonds between ring members or between ring members and non-ring members		

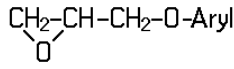


263/48	. . . . Nitrogen atoms not forming part of a nitro radical	267/10	. . . not condensed with other rings
263/50	. . . . . Benzene-sulfonamido oxazoles	267/12	. . . condensed with carbocyclic rings or ring systems
263/52	. condensed with carbocyclic rings or ring systems	267/14	. . . . condensed 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	269/00	<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 C07D 261/00 - C07D 267/00</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	271/00	<b>Heterocyclic compounds containing five-membered rings having two nitrogen atoms and one oxygen atom as the only ring hetero atoms</b>
265/00	<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 group <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	273/00	<b>Heterocyclic compounds containing rings having nitrogen and oxygen atoms as the only ring hetero atoms, not provided for by groups C07D 261/00 - C07D 271/00</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		
265/28	. 1,4-Oxazines; Hydrogenated 1,4-oxazines		
265/30	. . not condensed with other rings		
265/32	. . . with oxygen atoms directly attached to ring carbon atoms	275/00	<b>Heterocyclic compounds containing 1,2-thiazole or hydrogenated 1,2-thiazole rings</b>
265/33	. . . . Two oxygen atoms, in positions 3 and 5	275/02	. not condensed with other rings
265/34	. . condensed with carbocyclic rings	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
265/36	. . . condensed with one six-membered ring		
265/38	. . . [b, e]-condensed with two six-membered rings	275/04	. condensed with carbocyclic rings or ring systems
267/00	<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>	275/06	. . with hetero atoms directly attached to the ring sulfur atom
267/02	. Seven-membered rings	277/00	<b>Heterocyclic compounds containing 1,3-thiazole or hydrogenated 1,3-thiazole rings</b>
267/04	. . having the hetero atoms in positions 1 and 2	277/02	. not condensed with other rings
267/06	. . having the hetero atoms in positions 1 and 3		
267/08	. . having the hetero atoms in positions 1 and 4		



277/04	. . having no double bonds between ring members or between ring members and non-ring members	277/593	. . . . Z being doubly bound oxygen or doubly bound nitrogen, which nitrogen is part of a possibly substituted oximino radical
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	277/60	. condensed with carbocyclic rings or ring systems
277/08	. . having one double bond between ring members or between a ring member and a non-ring member	277/62	. . Benzothiazoles
277/10	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	277/64	. . . with only hydrocarbon or substituted hydrocarbon radicals attached in position 2
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	277/66	. . . . with aromatic rings or ring systems directly attached in position 2
277/14	. . . . Oxygen atoms	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
277/16	. . . . Sulfur atoms	277/70	. . . . Sulfur atoms
277/18	. . . . Nitrogen atoms	277/72	. . . . . 2-Mercaptobenzothiazole
277/20	. . having two or three double bonds between ring members or between ring members and non-ring members	277/74	. . . . . Sulfur atoms substituted by carbon atoms
277/22	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	277/76	. . . . . Sulfur atoms attached to a second hetero atom
277/24	. . . . Radicals substituted by oxygen atoms	277/78	. . . . . to a second sulphur atom
277/26	. . . . Radicals substituted by sulfur atoms	277/80	. . . . . to a nitrogen atom
277/28	. . . . Radicals substituted by nitrogen atoms	277/82	. . . . 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	277/84	. . Naphthothiazoles
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	<b>279/00</b>	<b>Heterocyclic compounds containing six-membered rings having one nitrogen atom and one sulfur atom as the only ring hetero atoms</b>
277/34	. . . . Oxygen atoms		<b>NOTE</b>
277/36	. . . . Sulfur atoms		Thiomorpholines having only hydrogen atoms attached to the ring carbon atoms are classified in group <a href="#">C07D 295/00</a> .
277/38	. . . . Nitrogen atoms	279/02	. 1,2-Thiazines; Hydrogenated 1,2-thiazines
277/40	. . . . . Unsubstituted amino or imino radicals	279/04	. 1,3-Thiazines; Hydrogenated 1,3-thiazines
277/42	. . . . . Amino or imino radicals substituted by hydrocarbon or substituted hydrocarbon radicals	279/06	. . not condensed with other rings
277/44	. . . . . Acylated amino or imino radicals	279/08	. . condensed with carbocyclic rings or ring systems
277/46	. . . . . by carboxylic acids, or sulfur or nitrogen analogues thereof	279/10	. 1,4-Thiazines; Hydrogenated 1,4-thiazines
277/48	. . . . . by radicals derived from carbonic acid, or sulfur or nitrogen analogues thereof, e.g. carbonylguanidines	279/12	. . not condensed with other rings
277/50	. . . . . Nitrogen atoms bound to hetero atoms	279/14	. . condensed with carbocyclic rings or ring systems
277/52	. . . . . to sulfur atoms, e.g. sulfonamides	279/16	. . . condensed with one six-membered ring
277/54	. . . . Nitrogen and either oxygen or sulfur atoms	279/18	. . . [b, e]-condensed with two six-membered rings
277/56	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	279/20	. . . . with hydrogen atoms directly attached to the ring nitrogen atom
277/58	. . . . Nitro radicals	279/22	. . . . with carbon atoms directly attached to the ring nitrogen atom
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. $\begin{array}{c} \text{—N—} \\   \\ \text{+—C—} \\   \\ \text{+—S—} \\   \\ \text{Z} \end{array} \text{—(CH}_2\text{)}_m\text{—C}\equiv$ with m	279/24	. . . . . with hydrocarbon radicals, substituted by amino radicals, attached to the ring nitrogen atom
	$\geq 0$ , Z being a singly or a doubly bound hetero 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
		279/34	. . . . with hetero atoms directly attached to the ring sulfur atom
		279/36	. . . [b, e]-condensed, at least one with a further condensed benzene ring
		<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>
		281/02	. Seven-membered rings

281/04	. . having the hetero atoms in positions 1 and 4	285/34	. . . 1,3,5-Thiadiazines; Hydrogenated 1,3,5-thiadiazines
281/06	. . . not condensed with other rings	285/36	. Seven-membered rings
281/08	. . . condensed with carbocyclic rings or ring systems	285/38	. Eight-membered rings
281/10	. . . . condensed with one six-membered ring	<b>291/00</b>	<b>Heterocyclic compounds containing rings having nitrogen, oxygen and sulfur atoms as the only ring hetero atoms</b>
281/12	. . . . condensed with two six-membered rings	291/02	. not condensed with other rings
281/14	. . . . . [b, e]-condensed	291/04	. . Five-membered rings
281/16	. . . . . [b, f]-condensed	291/06	. . Six-membered rings
281/18	. Eight-membered rings	291/08	. condensed with carbocyclic rings or ring systems
<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>	<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>
283/02	. having the hetero atoms in positions 1 and 3	293/02	. not condensed with other rings
<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>	293/04	. . Five-membered rings
285/01	. Five-membered rings	293/06	. . . Selenazoles; Hydrogenated selenazoles
285/02	. . Thiadiazoles; Hydrogenated thiadiazoles	293/08	. . Six-membered rings
285/04	. . . not condensed with other rings	293/10	. condensed with carbocyclic rings or ring systems
285/06	. . . . 1,2,3-Thiadiazoles; Hydrogenated 1,2,3-thiadiazoles	293/12	. . Selenazoles; Hydrogenated selenazoles
285/08	. . . . 1,2,4-Thiadiazoles; Hydrogenated 1,2,4-thiadiazoles	<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>
285/10	. . . . 1,2,5-Thiadiazoles; Hydrogenated 1,2,5-thiadiazoles	295/02	. containing only hydrogen and carbon atoms in addition to the ring hetero elements
285/12	. . . . 1,3,4-Thiadiazoles; Hydrogenated 1,3,4-thiadiazoles	295/023	. . Preparation; Separation; Stabilisation; Use of additives
285/125	. . . . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical	295/027	. . containing only one hetero ring
285/13	. . . . . Oxygen atoms	295/03	. . . with the ring nitrogen atoms directly attached to acyclic carbon atoms
285/135	. . . . . Nitrogen atoms	295/033	. . . with the ring nitrogen atoms directly attached to carbocyclic rings
285/14	. . . condensed with carbocyclic rings or ring systems	295/037	. . with quaternary ring nitrogen atoms
285/15	. Six-membered rings	295/04	. with substituted hydrocarbon radicals attached to ring nitrogen atoms
285/16	. . Thiadiazines; Hydrogenated thiadiazines	295/06	. . substituted by halogen atoms or nitro radicals
285/18	. . . 1,2,4-Thiadiazines; Hydrogenated 1,2,4-thiadiazines	295/067	. . . with the ring nitrogen atoms and the substituents attached to the same carbon chain, which is not interrupted by carbocyclic rings
285/20	. . . . condensed with carbocyclic rings or ring systems	295/073	. . . with the ring nitrogen atoms and the substituents separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
285/22	. . . . . condensed with one six-membered ring	295/08	. . substituted by singly bound oxygen or sulfur atoms
285/24	. . . . . with oxygen atoms directly attached to the ring sulfur atom	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
285/26	. . . . . substituted in position 6 or 7 by sulfamoyl or substituted sulfamoyl radicals	295/088	. . . . to an acyclic saturated chain
285/28	. . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached in position 3	295/092	. . . . with aromatic radicals attached to the chain
285/30	. . . . . with hydrocarbon radicals, substituted by hetero atoms, attached in position 3	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
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	295/10	. . substituted by doubly bound oxygen or sulphur atoms

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	301/03	. . by oxidation of unsaturated compounds, or of mixtures of unsaturated and saturated compounds
295/108	. . . . to an acyclic saturated chain	301/04	. . . with air or molecular oxygen
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	301/06	. . . . in the liquid phase
295/116	. . . . with the doubly bound oxygen or sulfur atoms directly attached to a carbocyclic ring	301/08	. . . . in the gaseous phase
295/12	. . substituted by singly or doubly bound nitrogen atoms ( <a href="#">nitro radicals C07D 295/06</a> )	301/10	. . . . with catalysts containing silver or gold
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	301/12	. . . with hydrogen peroxide or inorganic peroxides or peracids
295/13	. . . . to an acyclic saturated chain	301/14	. . . with organic peracids, or salts, anhydrides or esters thereof
295/135	. . . with the ring nitrogen atoms and the substituent nitrogen atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings	301/16	. . . . formed <i>in situ</i> , e.g. from carboxylic acids and hydrogen peroxide
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	301/18	. . . . . from polybasic carboxylic acids
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	301/19	. . . with organic hydroperoxides
295/15	. . . . to an acyclic saturated chain	301/22	. . by oxidation of saturated compounds with air or molecular oxygen ( <a href="#">of mixtures of unsaturated and saturated compounds C07D 301/04</a> )
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	301/24	. . by splitting off HAL—Y from compounds containing the radical HAL—C—C—OY
295/16	. acylated on ring nitrogen atoms	301/26	. . . Y being hydrogen
295/18	. . by radicals derived from carboxylic acids, or sulfur or nitrogen analogues thereof	301/27	. Condensation of epihalohydrins or halohydrins with compounds containing active hydrogen atoms ( <a href="#">macromolecular compounds C08</a> )
295/182	. . . Radicals derived from carboxylic acids	301/28	. . by reaction with hydroxyl radicals
295/185	. . . . from aliphatic carboxylic acids	301/30	. . by reaction with carboxyl radicals
295/192	. . . . from aromatic carboxylic acids	301/32	. Separation; Purification
295/194	. . . Radicals derived from thio- or thiono carboxylic acids	301/36	. Use of additives, e.g. for stabilisation
295/195	. . . Radicals derived from nitrogen analogues of carboxylic acids	<b>303/00</b>	<b>Compounds containing three-membered rings having one oxygen atom as the only ring hetero atom</b>
295/20	. . by radicals derived from carbonic acid, or sulfur or nitrogen analogues thereof	303/02	. Compounds containing oxirane rings
295/205	. . . Radicals derived from carbonic acid	303/04	. . containing only hydrogen and carbon atoms in addition to the ring oxygen atoms
295/21	. . . Radicals derived from sulfur analogues of carbonic acid	303/06	. . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings
295/215	. . . Radicals derived from nitrogen analogues of carbonic acid	303/08	. . with hydrocarbon radicals, substituted by halogen atoms, nitro radicals or nitroso radicals
295/22	. with hetero atoms directly attached to ring nitrogen atoms	303/10	. . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings
295/24	. . Oxygen atoms	303/12	. . with hydrocarbon radicals, substituted by singly or doubly bound oxygen atoms
295/26	. . Sulfur atoms	303/14	. . . by free hydroxyl radicals
295/28	. . Nitrogen atoms	303/16	. . . by esterified hydroxyl radicals
295/30	. . . non-acylated	303/17	. . . . containing oxirane rings condensed with carbocyclic ring systems having three or more relevant rings
295/32	. . . acylated with carboxylic or carbonic acids, or their nitrogen or sulfur analogues	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.
			
		303/24	. . . . . with polyhydroxy compounds
		303/26	. . . . . having one or more free hydroxyl radicals

#### Heterocyclic compounds having oxygen atoms, with or without sulphur, selenium, or tellurium atoms, as ring hetero atoms

<b>301/00</b>	<b>Preparation of oxiranes</b>
301/02	. Synthesis of the oxirane ring

303/27	. . . . . having all hydroxyl radicals etherified with oxirane containing compounds	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
303/28	. . . . Ethers with hydroxy compounds containing oxirane rings	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
303/30	. . . . . Ethers of oxirane-containing polyhydroxy compounds in which all hydroxyl radicals are etherified with oxirane-containing hydroxy compounds	307/20	. . . . Oxygen atoms
303/31	. . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings	307/22	. . . . Nitrogen atoms not forming part of a nitro radical
303/32	. . . by aldehydo- or ketonic radicals	307/24	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
303/34	. . with hydrocarbon radicals, substituted by sulphur, selenium or tellurium atoms	307/26	. . having one double bond between ring members or between a ring member and a non-ring member
303/36	. . with hydrocarbon radicals, substituted by nitrogen atoms (nitro, nitroso radicals C07D 303/08)	307/28	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
303/38	. . 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	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
303/40	. . . by ester radicals	307/32	. . . . Oxygen atoms
303/42	. . . . Acyclic compounds having a chain of seven or more carbon atoms, e.g. epoxidised fats	307/33	. . . . . in position 2, the oxygen atom being in its keto or unsubstituted enol form
303/44	. . . . Esterified with oxirane-containing hydroxy compounds	307/34	. . having two or three double bonds between ring members or between ring members and non-ring members
303/46	. . . by amide or nitrile radicals	307/36	. . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
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	307/38	. . . with substituted hydrocarbon radicals attached to ring carbon atoms
<b>305/00</b>	<b>Heterocyclic compounds containing four-membered rings having one oxygen atom as the only ring hetero atoms</b>	307/40	. . . . Radicals substituted by oxygen atoms
305/02	. not condensed with other rings	307/42	. . . . . Singly bound oxygen atoms
305/04	. . having no double bonds between ring members or between ring members and non-ring members	307/44	. . . . . Furfuryl alcohol
305/06	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring atoms	307/45	. . . . . Oxygen atoms acylated by a cyclopropane containing carboxylic acyl radical, e.g. chrysanthemumates
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	307/46	. . . . . Doubly bound oxygen atoms, or two oxygen atoms singly bound to the same carbon atom
305/10	. . having one or more double bonds between ring members or between ring members and non-ring members	307/48	. . . . . Furfural
305/12	. . . Beta-lactones	307/50	. . . . . Preparation from natural products
305/14	. condensed with carbocyclic rings or ring systems	307/52	. . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
<b>307/00</b>	<b>Heterocyclic compounds containing five-membered rings having one oxygen atom as the only ring hetero atom</b>	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
307/02	. not condensed with other rings	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
307/04	. . having no double bonds between ring members or between ring members and non-ring members	307/58	. . . . One oxygen atom, e.g. butenolide
307/06	. . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms	307/60	. . . . Two oxygen atoms, e.g. succinic anhydride
307/08	. . . . Preparation of tetrahydrofuran	307/62	. . . . Three oxygen atoms, e.g. ascorbic acid
307/10	. . . with substituted hydrocarbon radicals attached to ring carbon atoms	307/64	. . . . Sulfur atoms
307/12	. . . . Radicals substituted by oxygen atoms	307/66	. . . . Nitrogen atoms
307/14	. . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical	307/68	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
		307/70	. . . . Nitro radicals
		307/71	. . . . . attached in position 5

307/72	. . . . . with hydrocarbon radicals, substituted by nitrogen-containing radicals, attached in position 2	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
307/73	. . . . . by amino or imino, or substituted amino or imino radicals	309/10	. . . Oxygen atoms
307/74	. . . . . by hydrazino or hydrazono or such substituted radicals	309/12	. . . . only hydrogen atoms and one oxygen atom directly attached to ring carbon atoms, e.g. tetrahydropyranyl ethers
307/75	. . . . . having carboxylic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. hydrazides	309/14	. . . Nitrogen atoms not forming part of a nitro radical
307/76	. . . . . having carbonic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. semicarbazides	309/16	. having one double bond between ring members or between a ring member and a non-ring member
307/77	. ortho- or peri-condensed with carbocyclic rings or ring systems	309/18	. . containing only hydrogen and carbon atoms in addition to the ring hetero atom
307/78	. . Benzo [b] furans; Hydrogenated benzo [b] furans	309/20	. . with hydrogen atoms and substituted hydrocarbon radicals directly attached to ring carbon atoms
307/79	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the hetero ring	309/22	. . . Radicals substituted by oxygen atoms
307/80	. . . . Radicals substituted by oxygen atoms	309/24	. . . . Methylol radicals
307/81	. . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical	309/26	. . . . Carboxaldehyde radicals
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	309/28	. . 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
307/83	. . . . Oxygen atoms	309/30	. . . Oxygen atoms, e.g. delta-lactones
307/84	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	309/32	. having two double bonds between ring members or between ring members and non-ring members
307/85	. . . . . attached in position 2	309/34	. having three or more double bonds between ring members or between ring members and non-ring members
307/86	. . . with an oxygen atom directly attached in position 7	309/36	. . with oxygen atoms directly attached to ring carbon atoms
307/87	. . Benzo [c] furans; Hydrogenated benzo [c] furans	309/38	. . . one oxygen atom in position 2 or 4, e.g. pyrones
307/88	. . . with one oxygen atom directly attached in position 1 or 3	309/40	. . . Oxygen atoms attached in positions 3 and 4, e.g. maltol
307/885	. . . . 3,3-Diphenylphthalides	<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>
307/89	. . . with two oxygen atoms directly attached in positions 1 and 3	311/02	. ortho- or peri-condensed with carbocyclic rings or ring systems
307/90	. . . with an oxygen atom in position 1 and a nitrogen atom in position 3, or <u>vice versa</u>	311/04	. . Benzo[b]pyrans, not hydrogenated in the carbocyclic ring
307/91	. . Dibenzofurans; Hydrogenated dibenzofurans	311/06	. . . with oxygen or sulfur atoms directly attached in position 2
307/92	. . Naphthofurans; Hydrogenated naphthofurans	311/08	. . . . not hydrogenated in the hetero ring
307/93	. . condensed with a ring other than six-membered	311/10	. . . . . unsubstituted
307/935	. . . Not further condensed cyclopenta [b] furans or hydrogenated cyclopenta [b] furans	311/12	. . . . . substituted in position 3 and unsubstituted in position 7
307/937	. . . . with hydrocarbon or substituted hydrocarbon radicals directly attached in position 2, e.g. prostacyclins	311/14	. . . . . substituted in position 6 and unsubstituted in position 7
307/94	. spiro-condensed with carbocyclic rings or ring systems, e.g. griseofulvins	311/16	. . . . . substituted in position 7
<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>	311/18	. . . . . substituted otherwise than in position 3 or 7
309/02	. having no double bonds between ring members or between ring members and non-ring members	311/20	. . . . . hydrogenated in the hetero ring
309/04	. . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	311/22	. . . with oxygen or sulfur atoms directly attached in position 4
309/06	. . . Radicals substituted by oxygen 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
		311/26	. . . . with aromatic rings attached in position 2 or 3



311/28	. . . . . with aromatic rings attached in position 2 only	311/96	. . . . . spiro-condensed with carbocyclic rings or ring systems
311/30	. . . . . not hydrogenated in the hetero ring, e.g. flavones	<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>
311/32	. . . . . 2,3-Dihydro derivatives, e.g. flavanones	313/02	. . . . . Seven-membered rings
311/34	. . . . . with aromatic rings attached in position 3 only	313/04	. . . . . not condensed with other rings
311/36	. . . . . not hydrogenated in the hetero ring, e.g. isoflavones	313/06	. . . . . condensed with carbocyclic rings or ring systems
311/38	. . . . . 2,3-Dihydro derivatives, e.g. isoflavanones	313/08	. . . . . condensed with one six-membered ring
311/40	. . . . . Separation, e.g. from natural material; Purification	313/10	. . . . . condensed with two six-membered rings
311/42	. . . . . with oxygen or sulfur atoms in positions 2 and 4	313/12	. . . . . [b,e]-condensed
311/44	. . . . . with one hydrogen atom in position 3	313/14	. . . . . [b,f]-condensed
311/46	. . . . . unsubstituted in the carbocyclic ring	313/16	. . . . . Eight-membered rings
311/48	. . . . . with two such benzopyran radicals linked together by a carbon chain	313/18	. . . . . not condensed with other rings
311/50	. . . . . with elements other than carbon and hydrogen in position 3	313/20	. . . . . condensed with carbocyclic rings or ring systems
311/52	. . . . . Enol-esters or -ethers, or sulfur analogues thereof	<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>
311/54	. . . . . substituted in the carbocyclic ring	<b>317/00</b>	<b>Heterocyclic compounds containing five-membered rings having two oxygen atoms as the only ring hetero atoms</b>
311/56	. . . . . without hydrogen atoms in position 3	317/02	. . . . . having the hetero atoms in positions 1 and 2
311/58	. . . . . other than with oxygen or sulphur atoms in position 2 or 4	317/04	. . . . . not condensed with other rings
311/60	. . . . . with aryl radicals attached in position 2	317/06	. . . . . condensed with carbocyclic rings or ring systems
311/62	. . . . . with oxygen atoms directly attached in position 3, e.g. anthocyanidins	317/08	. . . . . having the hetero atoms in positions 1 and 3
311/64	. . . . . with oxygen atoms directly attached in position 8	317/10	. . . . . not condensed with other rings
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	317/12	. . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
311/68	. . . . . with nitrogen atoms directly attached in position 4	317/14	. . . . . with substituted hydrocarbon radicals 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	317/16	. . . . . Radicals substituted by halogen atoms or nitro radicals
311/72	. . . . . 3,4-Dihydro derivatives having in position 2 at least one methyl radical and in position 6 one oxygen atom, e.g. tocopherols	317/18	. . . . . Radicals substituted by singly bound oxygen or sulfur atoms
311/74	. . . . . Benzo[b]pyrans, hydrogenated in the carbocyclic ring	317/20	. . . . . Free hydroxyl or mercaptan
311/76	. . . . . Benzo[c]pyrans	317/22	. . . . . etherified
311/78	. . . . . Ring systems having three or more relevant rings	317/24	. . . . . esterified
311/80	. . . . . Dibenzopyrans; Hydrogenated dibenzopyrans	317/26	. . . . . Radicals substituted by doubly bound oxygen or sulfur atoms or by two such atoms singly bound to the same carbon atom
311/82	. . . . . Xanthenes	317/28	. . . . . Radicals substituted by nitrogen atoms ( <a href="#">nitro radicals C07D 317/16</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	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
311/86	. . . . . Oxygen atoms, e.g. xanthenes	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
311/88	. . . . . Nitrogen atoms	317/34	. . . . . Oxygen atoms
311/90	. . . . . with hydrocarbon radicals, substituted by amino radicals, directly attached in position 9	317/36	. . . . . Alkylene carbonates; Substituted alkylene carbonates
311/92	. . . . . Naphthopyrans; Hydrogenated naphthopyrans	317/38	. . . . . Ethylene carbonate
311/94	. . . . . condensed with rings other than six-membered or with ring systems containing such rings	317/40	. . . . . Vinylene carbonate; Substituted vinylene carbonates
		317/42	. . . . . Halogen atoms or nitro radicals
		317/44	. . . . . ortho- or peri-condensed with carbocyclic rings or ring systems
		317/46	. . . . . condensed with one six-membered ring

317/48	. . . . Methylenedioxybenzenes or hydrogenated methylenedioxybenzenes, unsubstituted on the hetero ring	323/06	. . Trioxane
317/50	. . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to atoms of the carbocyclic ring	<b>325/00</b>	<b>Heterocyclic compounds containing rings having oxygen as the only ring hetero atom according to more than one of groups <a href="#">C07D 303/00</a> - <a href="#">C07D 323/00</a></b>
317/52	. . . . . Radicals substituted by halogen atoms or nitro radicals	<b>327/00</b>	<b>Heterocyclic compounds containing rings having oxygen and sulfur atoms as the only ring hetero atoms</b>
317/54	. . . . . Radicals substituted by oxygen atoms	327/02	. one oxygen atom and one sulfur atom
317/56	. . . . . Radicals substituted by sulfur atoms	327/04	. . Five-membered rings
317/58	. . . . . Radicals substituted by nitrogen atoms (nitro radicals <a href="#">C07D 317/52</a> )	327/06	. . Six-membered rings
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	327/08	. . . [b,e]-condensed with two six-membered carbocyclic rings
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	327/10	. two oxygen atoms and one sulfur atom, e.g. cyclic sulfates
317/64	. . . . . Oxygen atoms	<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>
317/66	. . . . . Nitrogen atoms not forming part of a nitro radical	<b><u>Heterocyclic compounds having sulfur, selenium or tellurium as the only ring hetero atoms</u></b>	
317/68	. . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	<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>
317/70	. . . condensed with ring systems containing two or more relevant rings	331/02	. Three-membered rings
317/72	. . spiro-condensed with carbocyclic rings	331/04	. Four-membered rings
<b>319/00</b>	<b>Heterocyclic compounds containing six-membered rings having two oxygen atoms as the only ring hetero atoms</b>	<b>333/00</b>	<b>Heterocyclic compounds containing five-membered rings having one sulfur atom as the only ring hetero atom</b>
319/02	. 1,2-Dioxanes; Hydrogenated 1,2-dioxanes	333/02	. not condensed with other rings
319/04	. 1,3-Dioxanes; Hydrogenated 1,3-dioxanes	333/04	. . not substituted on the ring sulphur atom
319/06	. . not condensed with other rings	333/06	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring carbon atoms
319/08	. . condensed with carbocyclic rings or ring systems	333/08	. . . . Hydrogen atoms or radicals containing only hydrogen and carbon atoms
319/10	. 1,4-Dioxanes; Hydrogenated 1,4-dioxanes	333/10	. . . . . Thiophene
319/12	. . not condensed with other rings	333/12	. . . . Radicals substituted by halogen atoms or nitro or nitroso radicals
319/14	. . condensed with carbocyclic rings or ring systems	333/14	. . . . Radicals substituted by singly bound hetero atoms other than halogen
319/16	. . . condensed with one six-membered ring	333/16	. . . . . by oxygen atoms
319/18	. . . . Ethylenedioxybenzenes, not substituted on the hetero ring	333/18	. . . . . by sulfur atoms
319/20	. . . . with substituents attached to the hetero ring	333/20	. . . . . by nitrogen atoms (nitro, nitroso radicals <a href="#">C07D 333/12</a> )
319/22	. . . condensed with one naphthalene or hydrogenated naphthalene ring system	333/22	. . . . Radicals substituted by doubly bound hetero atoms, or by two hetero atoms other than halogen singly bound to the same carbon atom
319/24	. . . [b,e]-condensed with two six-membered rings	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
<b>321/00</b>	<b>Heterocyclic compounds containing rings having two oxygen atoms as the only ring hetero atoms, not provided for by groups <a href="#">C07D 317/00</a> - <a href="#">C07D 319/00</a></b>	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
321/02	. Seven-membered rings	333/28	. . . . Halogen atoms
321/04	. . not condensed with other rings	333/30	. . . . Hetero atoms other than halogen
321/06	. . . 1,3-Dioxepines; Hydrogenated 1,3-dioxepines	333/32	. . . . . Oxygen atoms
321/08	. . . 1,4-Dioxepines; Hydrogenated 1,4-dioxepines	333/34	. . . . . Sulfur atoms
321/10	. . condensed with carbocyclic rings or ring systems		
321/12	. Eight-membered rings		
<b>323/00</b>	<b>Heterocyclic compounds containing more than two oxygen atoms as the only ring hetero atoms</b>		
323/02	. Five-membered rings		
323/04	. Six-membered rings		

- 333/36 . . . . Nitrogen atoms
- 333/38 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 333/40 . . . . Thiophene-2-carboxylic acid
- 333/42 . . . . with nitro or nitroso radicals directly attached to ring carbon atoms
- 333/44 . . . . attached in position 5
- 333/46 . . substituted on the ring sulfur atom
- 333/48 . . . by oxygen atoms
- 333/50 . condensed with carbocyclic rings or ring systems
- 333/52 . . Benzo[b]thiophenes; Hydrogenated benzo[b]thiophenes
- 333/54 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the hetero ring
- 333/56 . . . . Radicals substituted by oxygen atoms
- 333/58 . . . . Radicals substituted by nitrogen atoms
- 333/60 . . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 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
- 333/64 . . . . Oxygen atoms
- 333/66 . . . . Nitrogen atoms not forming part of a nitro radical
- 333/68 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 333/70 . . . . attached in position 2
- 333/72 . . Benzo[c]thiophenes; Hydrogenated benzo[c]thiophenes
- 333/74 . . Naphthothiophenes
- 333/76 . . Dibenzothiophenes
- 333/78 . . condensed with rings other than six-membered or with ring systems containing such rings
- 333/80 . . . Seven-membered rings
- 335/00 Heterocyclic compounds containing six-membered rings having one sulfur atom as the only ring hetero atom**
- 335/02 . not condensed with other rings
- 335/04 . condensed with carbocyclic rings or ring systems
- 335/06 . . Benzothiopyrans; Hydrogenated benzothiopyrans
- 335/08 . . Naphthothiopyrans; Hydrogenated naphthothiopyrans
- 335/10 . . Dibenzothiopyrans; Hydrogenated dibenzothiopyrans
- 335/12 . . . Thioxanthenes
- 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
- 335/16 . . . . Oxygen atoms, e.g. thioxanthenes
- 335/18 . . . . Nitrogen atoms
- 335/20 . . . . with hydrocarbon radicals, substituted by amino radicals, directly attached in position 9
- 337/00 Heterocyclic compounds containing rings of more than six members having one sulfur atom as the only ring hetero atom**
- 337/02 . Seven-membered rings

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

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

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

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

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

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

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

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

**NOTE**

Groups [C07D 401/00](#) - [C07D 421/00](#) cover compounds containing two or more relevant hetero rings at least two of which are covered by different main groups of groups [C07D 203/00](#) - [C07D 347/00](#), neither condensed among themselves nor condensed with a common carbocyclic ring or ring system.

**401/00 Heterocyclic compounds containing two or more hetero rings, having nitrogen atoms as the only ring hetero atoms, at least one ring being a six-membered ring with only one nitrogen atom**

- 401/02 . containing two hetero rings
- 401/04 . . directly linked by a ring-member-to-ring-member bond
- 401/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 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
- 401/14 . containing three or more hetero rings

**403/00 Heterocyclic compounds containing two or more hetero rings, having nitrogen atoms as the only ring hetero atoms, not provided for by group [C07D 401/00](#)**

- 403/02 . containing two hetero rings
- 403/04 . . directly linked by a ring-member-to-ring-member bond
- 403/06 . . linked by a carbon chain containing only aliphatic carbon atoms

- 403/08 . . linked by a carbon chain containing alicyclic rings
- 403/10 . . linked by a carbon chain containing aromatic rings
- 403/12 . . linked by a chain containing hetero atoms as chain links
- 403/14 . containing three or more hetero rings
- 405/00 Heterocyclic compounds containing both one or more hetero rings having oxygen atoms as the only ring hetero atoms, and one or more rings having nitrogen as the only ring hetero atom**
- 405/02 . containing two hetero rings
- 405/04 . . directly linked by a ring-member-to-ring-member bond
- 405/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 405/08 . . linked by a carbon chain containing alicyclic rings
- 405/10 . . linked by a carbon chain containing aromatic rings
- 405/12 . . linked by a chain containing hetero atoms as chain links
- 405/14 . containing three or more hetero rings
- 407/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having oxygen atoms as the only ring hetero atoms, not provided for by group [C07D 405/00](#)**
- 407/02 . containing two hetero rings
- 407/04 . . directly linked by a ring-member-to-ring-member bond
- 407/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 407/08 . . linked by a carbon chain containing alicyclic rings
- 407/10 . . linked by a carbon chain containing aromatic rings
- 407/12 . . linked by a chain containing hetero atoms as chain links
- 407/14 . containing three or more hetero rings
- 409/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having sulfur atoms as the only ring hetero atoms**
- 409/02 . containing two hetero rings
- 409/04 . . directly linked by a ring-member-to-ring-member bond
- 409/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 409/08 . . linked by a carbon chain containing alicyclic rings
- 409/10 . . linked by a carbon chain containing aromatic rings
- 409/12 . . linked by a chain containing hetero atoms as chain links
- 409/14 . containing three or more hetero rings
- 411/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having oxygen and sulfur atoms as the only ring hetero atoms**
- 411/02 . containing two hetero rings
- 411/04 . . directly linked by a ring-member-to-ring-member bond
- 411/06 . . linked by a carbon chain containing only aliphatic carbon atoms

- 411/08 . . linked by a carbon chain containing alicyclic rings
- 411/10 . . linked by a carbon chain containing aromatic rings
- 411/12 . . linked by a chain containing hetero atoms as chain links
- 411/14 . containing three or more hetero rings
- 413/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having nitrogen and oxygen atoms as the only ring hetero atoms**
- 413/02 . containing two hetero rings
- 413/04 . . directly linked by a ring-member-to-ring-member bond
- 413/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 413/08 . . linked by a carbon chain containing alicyclic rings
- 413/10 . . linked by a carbon chain containing aromatic rings
- 413/12 . . linked by a chain containing hetero atoms as chain links
- 413/14 . containing three or more hetero rings
- 415/00 Heterocyclic compounds containing the thiamine skeleton**
- 417/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having nitrogen and sulfur atoms as the only ring hetero atoms, not provided for by group [C07D 415/00](#)**
- 417/02 . containing two hetero rings
- 417/04 . . directly linked by a ring-member-to-ring-member bond
- 417/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 417/08 . . linked by a carbon chain containing alicyclic rings
- 417/10 . . linked by a carbon chain containing aromatic rings
- 417/12 . . linked by a chain containing hetero atoms as chain links
- 417/14 . containing three or more hetero rings
- 419/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having nitrogen, oxygen, and sulfur atoms as the only ring hetero atoms**
- 419/02 . containing two hetero rings
- 419/04 . . directly linked by a ring-member-to-ring-member bond
- 419/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 419/08 . . linked by a carbon chain containing alicyclic rings
- 419/10 . . linked by a carbon chain containing aromatic rings
- 419/12 . . linked by a chain containing hetero atoms as chain links
- 419/14 . containing three or more hetero rings
- 421/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having selenium, tellurium, or halogen atoms as ring hetero atoms**
- 421/02 . containing two hetero rings



- 421/04 . . directly linked by a ring-member-to-ring-member bond
- 421/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 421/08 . . linked by a carbon chain containing alicyclic rings
- 421/10 . . linked by a carbon chain containing aromatic rings
- 421/12 . . linked by a chain containing hetero atoms as chain links
- 421/14 . containing three or more hetero rings

#### Heterocyclic compounds containing condensed hetero ring systems

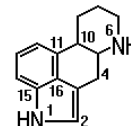
##### NOTES

- Groups [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.
- 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.
- 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](#).
- 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
  - 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:**

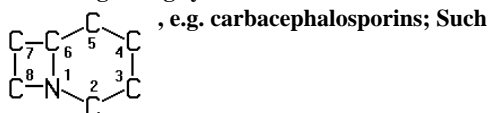


**lysergic acid** (compounds of the cyclic peptide type derived from ergotamine [C07D 519/02](#))

- 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 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:**



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

- 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
- 471/06 . . Peri-condensed systems
- 471/08 . . Bridged systems
- 471/10 . . Spiro-condensed systems
- 471/12 . in which the condensed system contains three hetero rings
- 471/14 . . Ortho-condensed systems
- 471/16 . . Peri-condensed systems
- 471/18 . . Bridged systems
- 471/20 . . Spiro-condensed systems
- 471/22 . in which the condensed systems contains four or more hetero rings

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

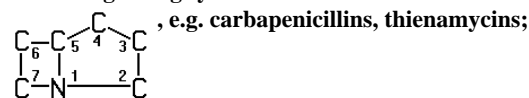
- 473/02 . with oxygen, sulphur, or nitrogen atoms directly attached in positions 2 and 6
- 473/04 . . two oxygen atoms
- 473/06 . . . with radicals containing only hydrogen and carbon atoms, attached in position 1 or 3
- 473/08 . . . . with methyl radicals in positions 1 and 3, e.g. theophylline

- 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, sulphur, 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 position 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 sulphur-containing hetero ring**

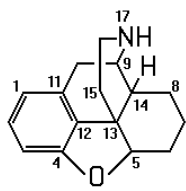
- 477/02 . Preparation (by [microbiological processes](#) [C12P 17/18](#))
- 477/04 . . by forming the ring or condensed ring systems
- 477/06 . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of 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 groups C07D 451/00 - C07D 477/00**

- 487/02 . in which the condensed system contains two hetero rings
- 487/04 . . Ortho-condensed systems
- 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
- 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
- 491/20 . . Spiro-condensed systems
- 491/22 . in which the condensed system contains four or more hetero rings

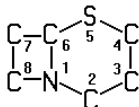
**493/00 Heterocyclic compounds containing oxygen atoms as the only ring hetero atoms in the condensed system**

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

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

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

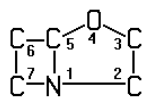
- 495/18 . . Bridged systems
- 495/20 . . Spiro-condensed systems
- 495/22 . in which the condensed system contains four or more hetero rings
- 497/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having oxygen and sulfur atoms as the only ring hetero atoms**
- 497/02 . in which the condensed system contains two hetero rings
- 497/04 . . Ortho-condensed systems
- 497/06 . . Peri-condensed systems
- 497/08 . . Bridged systems
- 497/10 . . Spiro-condensed systems
- 497/12 . in which the condensed system contains three hetero rings
- 497/14 . . Ortho-condensed systems
- 497/16 . . Peri-condensed systems
- 497/18 . . Bridged systems
- 497/20 . . Spiro-condensed systems
- 497/22 . in which the condensed system contains four or more hetero rings
- 498/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having nitrogen and oxygen atoms as the only ring hetero atoms (4-oxa-1-azabicyclo [3.2.0] heptanes, e.g. oxapenicillins C07D 503/00; 5-oxa-1-azabicyclo [4.2.0] octanes, e.g. oxacephalosporins C07D 505/00; analogues thereof having ring oxygen atoms in other position C07D 507/00)**
- 498/02 . in which the condensed system contains two hetero rings
- 498/04 . . Ortho-condensed systems
- 498/06 . . Peri-condensed systems
- 498/08 . . Bridged systems
- 498/10 . . Spiro-condensed systems
- 498/12 . in which the condensed system contains three hetero rings
- 498/14 . . Ortho-condensed systems
- 498/16 . . Peri-condensed systems
- 498/18 . . Bridged systems
- 498/20 . . Spiro-condensed systems
- 498/22 . in which the condensed system contains four or more hetero rings
- 499/00 Heterocyclic compounds containing 4-thia-1-azabicyclo [3.2.0] heptane ring systems, i.e. compounds containing a ring system of the formula:**
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- , e.g. penicillins, penems;**
- Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring**
- 499/04 . Preparation
- 499/06 . . by forming the ring or condensed ring systems (by microbiological processes C12P 37/00)
- 499/08 . . Modification of a carboxyl radical directly attached in position 2, e.g. esterification
- 499/10 . . Modification of an amino radical directly attached in position 6
- 499/12 . . . Acylation
- 499/14 . . Preparation of salts
- 499/16 . . . of alkali or alkaline earth metals
- 499/18 . . Separation; Purification
- 499/20 . . . via salts with organic bases
- 499/21 . with a nitrogen atom directly attached in position 6 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/22 . . Salts with organic bases; Complexes with organic compounds
- 499/24 . . . with acyclic or carbocyclic compounds containing amino radicals
- 499/26 . . . with heterocyclic compounds
- 499/28 . . with modified 2-carboxyl group
- 499/30 . . . Acid anhydride
- 499/32 . . . Esters
- 499/34 . . . Thio-acid; Esters thereof
- 499/36 . . . . O-esters
- 499/38 . . . . S-esters
- 499/40 . . . Amides; Hydrazides; Azides
- 499/42 . . Compounds with a free primary amino radical attached in position 6
- 499/44 . . Compounds with an amino radical acylated by carboxylic acids, attached in position 6
- 499/46 . . . with acyclic hydrocarbon radicals or such radicals substituted by carbocyclic or heterocyclic rings, attached to the carboxamido radical
- 499/48 . . . with a carbon chain, substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, attached to the carboxamido radical
- 499/50 . . . . substituted in beta-position to the carboxamido radical
- 499/52 . . . . . by oxygen or sulfur atoms
- 499/54 . . . . . by nitrogen atoms
- 499/56 . . . . . by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 499/58 . . . . substituted in alpha-position to the carboxamido radical
- 499/60 . . . . . by oxygen atoms
- 499/62 . . . . . by sulfur atoms
- 499/64 . . . . . by nitrogen atoms
- 499/66 . . . . . with alicyclic rings as additional substituents on the carbon chain
- 499/68 . . . . . with aromatic rings as additional substituents on the carbon chain
- 499/70 . . . . . with hetero rings as additional substituents on the carbon chain
- 499/72 . . . . . by carbon atoms having three bonds to hetero atoms
- 499/74 . . . with carbocyclic rings directly attached to the carboxamido radical
- 499/76 . . . with hetero rings directly attached to the carboxamido radical
- 499/78 . . Compounds with an amino radical, acylated by carbonic acid, or by nitrogen or sulfur analogues thereof, attached in position 6
- 499/80 . . Compounds with a nitrogen-containing hetero ring, attached with the ring nitrogen atom in position 6

499/86	• with only atoms other than nitrogen atoms directly attached in position 6 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2	501/18	• • • 7-Aminocephalosporanic or substituted 7-aminocephalosporanic acids
499/861	• • with a hydrocarbon radical or a substituted hydrocarbon radical, directly attached in position 6	501/20	• • • 7-Acylaminocephalosporanic or substituted 7-acylaminocephalosporanic acids in which the acyl radicals are derived from carboxylic acids
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	501/22	• • • • with radicals containing only hydrogen and carbon atoms, attached in position 3
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	501/24	• • • • with hydrocarbon radicals, substituted by hetero atoms or hetero rings, attached in position 3
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	501/26	• • • • • Methylene radicals, substituted by oxygen atoms; Lactones thereof with the 2-carboxyl group
499/881	• • with a hydrogen atom or an unsubstituted hydrocarbon radical, attached in position 3	501/28	• • • • • with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
499/883	• • with a substituted hydrocarbon radical attached in position 3	501/30	• • • • • with the 7-amino-radical acylated by an araliphatic carboxylic acid
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	501/32	• • • • • with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
499/893	• • with a hetero ring or a condensed hetero ring system, directly attached in position 3	501/34	• • • • • with the 7-amino radical acylated by carboxylic acids containing hetero rings
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	501/36	• • • • • Methylene radicals, substituted by sulfur atoms
499/90	• further condensed with carbocyclic rings or ring systems	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
501/00	<b>Heterocyclic compounds containing 5-thia-1-azabicyclo [4.2.0] octane ring systems, i.e. compounds containing a ring system of the formula:</b>  <b>, e.g. cephalosporins;</b> <b>Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring</b>	501/40	• • • • • with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
501/02	• Preparation	501/42	• • • • • with the 7-amino radical acylated by an araliphatic carboxylic acid
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	501/44	• • • • • with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
501/06	• • • Acylation of 7-aminocephalosporanic acid	501/46	• • • • • with the 7-amino radical acylated by carboxylic acids containing hetero rings
501/08	• • by forming the ring or condensed ring systems (by microbiological processes <a href="#">C12P 35/00</a> )	501/48	• • • • • Methylene radicals, substituted by hetero rings ( <a href="#">C07D 501/38</a> - <a href="#">C07D 501/46</a> take precedence)
501/10	• • • from compounds containing the penicillin ring system	501/50	• • • • • with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
501/12	• • Separation; Purification	501/52	• • • • • with the 7-amino radical acylated by an araliphatic carboxylic acid
501/14	• Compounds having a nitrogen atom directly attached in position 7	501/54	• • • • • with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
501/16	• • with a double bond between positions 2 and 3	501/56	• • • • • with the 7-amino radical acylated by carboxylic acids containing hetero rings
		501/57	• • • • with a further substituent in position 7, e.g. cephamycines
		501/58	• • • with a nitrogen atom, which is a member of a hetero ring, attached in position 7
		501/59	• • • with hetero atoms directly attached in position 3
		501/60	• • with a double bond between positions 3 and 4



501/62 . . . . . Compounds further condensed with a carbocyclic ring or ring system

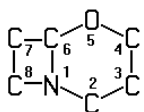
**503/00 Heterocyclic compounds containing 4-oxa-1-azabicyclo [3.2.0] heptane ring systems, i.e. compounds containing a ring system of the formula:**



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

- 503/02 . . Preparation (by [microbiological processes C12P 17/18](#))
- 503/04 . . by forming the ring or condensed ring systems
- 503/06 . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 503/08 . . . Modification of a carboxyl group directly attached in position 2, e.g. esterification
- 503/10 . . with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 503/12 . . unsubstituted in position 6
- 503/14 . . . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, other than a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, attached in position 3
- 503/16 . . . Radicals substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical
- 503/18 . . . . . by oxygen atoms
- 503/20 . . . . . by sulfur atoms
- 503/22 . . . . . by nitrogen atoms

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



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

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

- 505/18 . . . . . further acylated by radicals derived from carboxylic acids or by nitrogen or sulfur analogues thereof
- 505/20 . . . . . with the acylating radicals further substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 505/22 . . . . . further substituted by singly-bound nitrogen atoms
- 505/24 . . . . . further substituted by doubly-bound nitrogen atoms

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

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

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

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

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

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



- 515/22 . in which the condensed system contains four or more hetero rings
- 517/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having selenium, tellurium, or halogen atoms as ring hetero atoms**
- 517/02 . in which the condensed system contains two hetero rings
- 517/04 . . Ortho-condensed systems
- 517/06 . . Peri-condensed systems
- 517/08 . . Bridged systems
- 517/10 . . Spiro-condensed systems
- 517/12 . in which the condensed system contains three hetero rings
- 517/14 . . Ortho-condensed systems
- 517/16 . . Peri-condensed systems
- 517/18 . . Bridged systems
- 517/20 . . Spiro-condensed systems
- 517/22 . in which the condensed system contains four or more hetero rings
- 519/00 Heterocyclic compounds containing more than one system of two or more relevant hetero rings condensed among themselves or condensed with a common carbocyclic ring system not provided for in groups [C07D 453/00](#) or [C07D 455/00](#)**
- 519/02 . Ergot alkaloids of the cyclic peptide type
- 519/04 . Dimeric indole alkaloids, e.g. vincalucoblastine
- 519/06 . containing at least one condensed beta-lactam ring system, provided for by groups [C07D 463/00](#), [C07D 477/00](#) or [C07D 499/00](#) - [C07D 507/00](#), e.g. a penem or a cepham system
- 521/00 Heterocyclic compounds containing unspecified hetero rings**

**NOTE**

This group is only used for the classification of heterocyclic compounds the chemical structure of which are 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](#).