

# CPC COOPERATIVE PATENT CLASSIFICATION

## C CHEMISTRY; METALLURGY

(NOTES omitted)

### CHEMISTRY

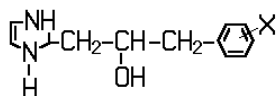
## C07 ORGANIC CHEMISTRY

(NOTES omitted)

## C07D HETEROCYCLIC COMPOUNDS

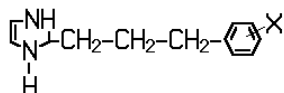
### NOTES

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



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>.**WARNING**

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

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

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

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

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

**205/00 Heterocyclic compounds containing four-membered rings with one nitrogen atom as the only ring hetero atom**

- 205/02 . not condensed with other rings
- 205/04 . . having no double bonds between ring members or between ring members and non-ring members
- 205/06 . . having one double bond between ring members or between a ring member and a non-ring member
- 205/08 . . . with one oxygen atom directly attached in position 2, e.g. beta-lactams

- 205/085 . . . . with a nitrogen atom directly attached in position 3
- 205/09 . . . . with a sulfur atom directly attached in position 4
- 205/095 . . . . . and with a nitrogen atom directly attached in position 3
- 205/10 . . having two double bonds between ring members or between ring members and non-ring members
- 205/12 . condensed with carbocyclic rings or ring systems

**207/00 Heterocyclic compounds containing five-membered rings not condensed with other rings, with one nitrogen atom as the only ring hetero atom****NOTE**

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

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

207/267	. . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to the ring nitrogen atom	207/44	. . having three double bonds between ring members or between ring members and non-ring members
207/27	. . . . . with substituted hydrocarbon radicals directly attached to the ring nitrogen atom	207/444	. . . having two doubly-bound oxygen atoms directly attached in positions 2 and 5
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	207/448	. . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms, e.g. maleimide
207/277	. . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals	207/452	. . . . . with hydrocarbon radicals, substituted by hetero atoms, directly attached to the ring nitrogen atom
207/28	. . . . . 2-Pyrrolidone-5- carboxylic acids; Functional derivatives thereof, e.g. esters, nitriles	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
207/30	. . having two double bonds between ring members or between ring members and non-ring members	207/46	. with hetero atoms directly attached to the ring nitrogen atom
207/32	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	207/48	. . Sulfur atoms
207/323	. . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to the ring nitrogen atoms	207/50	. . Nitrogen atoms
207/325	. . . . with substituted hydrocarbon radicals directly attached to the ring nitrogen atom	<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>
207/327	. . . . 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	209/02	. condensed with one carbocyclic ring
207/33	. . . . with substituted hydrocarbon radicals, directly attached to ring carbon atoms	209/04	. . Indoles; Hydrogenated indoles
207/333	. . . . Radicals substituted by oxygen or sulfur atoms	209/06	. . . Preparation of indole from coal-tar
207/335	. . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical	209/08	. . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly 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	209/10	. . . with substituted hydrocarbon radicals attached to carbon atoms of the hetero ring
207/34	. . . with heteroatoms or with carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms	209/12	. . . . Radicals substituted by oxygen atoms
207/36	. . . . Oxygen or sulfur atoms	209/14	. . . . Radicals substituted by nitrogen atoms, not forming part of a nitro radical
207/38	. . . . 2-Pyrrolones	209/16	. . . . . Tryptamines
207/40	. . . . 2,5-Pyrrolidine-diones	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
207/404	. . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms, e.g. succinimide	209/20	. . . . . substituted additionally by nitrogen atoms, e.g. tryptophane
207/408	. . . . . Radicals containing only hydrogen and carbon atoms attached to ring carbon atoms	209/22	. . . . . with an aralkyl radical attached to the ring nitrogen atom
207/412	. . . . . Acyclic radicals containing more than six carbon atoms	209/24	. . . . . with an alkyl or cycloalkyl 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	209/26	. . . . . with an acyl radical attached to the ring nitrogen atom
207/42	. . . . Nitro radicals	209/28	. . . . . 1-(4-Chlorobenzoyl)-2-methyl-indolyl-3-acetic acid, substituted in position 5 by an oxygen or nitrogen atom; Esters thereof
		209/30	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, directly attached to carbon atoms of the hetero ring
		209/32	. . . . Oxygen atoms
		209/34	. . . . . in position 2
		209/36	. . . . . in position 3, e.g. adrenochrome
		209/38	. . . . . in positions 2 and 3, e.g. isatin
		209/40	. . . . Nitrogen atoms, not forming part of a nitro radical, e.g. isatin semicarbazone

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

211/68	. . having one double bond between ring members or between a ring member and a non-ring member	213/24	. . . with substituted hydrocarbon radicals attached to ring carbon atoms
211/70	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	213/26	. . . . Radicals substituted by halogen atoms or nitro radicals
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	213/28	. . . . Radicals substituted by singly-bound oxygen or sulfur atoms ( <a href="#">bound to the same carbon atom C07D 213/44</a> )
211/74	. . . . Oxygen atoms	213/30	. . . . . Oxygen atoms
211/76	. . . . . attached in position 2 or 6	213/32	. . . . . Sulfur atoms
211/78	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	213/34	. . . . . to which a second heteroatom is attached
211/80	. . having two double bonds between ring members or between ring members and non-ring members	213/36	. . . . Radicals substituted by singly-bound nitrogen atoms ( <a href="#">nitro radicals C07D 213/26</a> )
211/82	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	213/38	. . . . . having only hydrogen, hydrocarbon radicals attached to the 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	213/40	. . . . . Acylated substituent nitrogen atom
211/86	. . . . Oxygen atoms	213/42	. . . . . having hetero atoms attached to the substituent nitrogen atom ( <a href="#">nitro radicals C07D 213/26</a> )
211/88	. . . . . attached in positions 2 and 6, e.g. glutarimide	213/44	. . . . Radicals substituted by doubly-bound oxygen, sulfur, or nitrogen atoms, or by two such atoms singly-bound to the same carbon atom
211/90	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	213/46	. . . . . Oxygen atoms
211/92	. with a hetero atom directly attached to the ring nitrogen atom	213/48	. . . . . Aldehydo radicals
211/94	. . Oxygen atom, e.g. piperidine N-oxide	213/50	. . . . . Ketonic radicals
211/96	. . Sulfur atom	213/51	. . . . . Acetal radicals
211/98	. . Nitrogen atom	213/52	. . . . . Sulfur 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>	213/53	. . . . . Nitrogen atoms
213/02	. having three double bonds between ring members or between ring members and non-ring members	213/54	. . . . Radicals substituted by carbon atoms having three bonds to heteroatoms, with at the most one to halogen, e.g. ester or nitrile radicals
213/04	. . 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	213/55	. . . . . Acids; Esters
213/06	. . . containing only hydrogen and carbon atoms in addition to the ring nitrogen atom	213/56	. . . . . Amides
213/08	. . . . Preparation by ring-closure	213/57	. . . . . Nitriles
213/09	. . . . . involving the use of ammonia, amines, amine salts, or nitriles	213/58	. . . . . Amidines
213/10	. . . . . from acetaldehyde or cyclic polymers thereof	213/59	. . . . . with at least one of the bonds being to sulfur
213/12	. . . . . from unsaturated compounds	213/60	. . . with heteroatoms or with carbon atoms having three bonds to hetero atoms, with at the most one to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
213/127	. . . . Preparation from compounds containing pyridine rings	213/61	. . . . Halogen atoms or nitro radicals
213/133	. . . . Preparation by dehydrogenation of hydrogenated pyridine compounds	213/62	. . . . Oxygen or sulfur atoms
213/14	. . . . Preparation from compounds containing heterocyclic oxygen	213/63	. . . . . One oxygen atom
213/16	. . . . containing only one pyridine ring	213/64	. . . . . attached in position 2 or 6
213/18	. . . . . Salts thereof	213/643	. . . . . 2-Phenoxy pyridines; Derivatives thereof
213/20	. . . . . Quaternary compounds thereof	213/647	. . . . . and having in the molecule an acyl radical containing a saturated three-membered ring, e.g. chrysanthemumic acid esters
213/22	. . . . containing two or more pyridine rings directly linked together, e.g. bipyridyl	213/65	. . . . . attached in position 3 or 5
		213/66	. . . . . having in position 3 an oxygen atom and in each of the positions 4 and 5 a carbon atom bound to an oxygen, sulfur or nitrogen atom, e.g. pyridoxal
		213/67	. . . . . 2-Methyl-3-hydroxy-4,5-bis(hydroxy-methyl)pyridine, i.e. pyridoxine
		213/68	. . . . . attached in position 4
		213/69	. . . . . Two or more oxygen atoms
		213/70	. . . . . Sulfur atoms



213/71	. . . . . to which a second hetero atom is attached	215/233	. . . . . only one oxygen atom which is attached in position 4
213/72	. . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 213/61</a> )	215/24	. . . . attached in position 8
213/73	. . . . . Unsubstituted amino or imino radicals	215/26	. . . . . Alcohols; Ethers thereof
213/74	. . . . . Amino or imino radicals substituted by hydrocarbon or substituted hydrocarbon radicals	215/28	. . . . . with halogen atoms or nitro radicals in positions 5, 6 or 7
213/75	. . . . . Amino or imino radicals, acylated by carboxylic or carbonic acids, or by sulfur or nitrogen analogues thereof, e.g. carbamates	215/30	. . . . . Metal salts; Chelates
213/76	. . . . . to which a second hetero atom is attached ( <a href="#">nitro radicals C07D 213/61</a> )	215/32	. . . . . Esters
213/77	. . . . . Hydrazine radicals	215/34	. . . . . Carbamates
213/78	. . . . Carbon atoms having three bonds to hetero atoms, with at the most one to halogen, e.g. ester or nitrile radicals	215/36	. . . Sulfur atoms ( <a href="#">C07D 215/24 takes precedence</a> )
213/79	. . . . . Acids; Esters	215/38	. . . Nitrogen atoms ( <a href="#">nitro radicals C07D 215/18</a> )
213/80	. . . . . in position 3	215/40	. . . . attached in position 8
213/803	. . . . . Processes of preparation	215/42	. . . . attached in position 4
213/807	. . . . . by oxidation of pyridines or condensed pyridines	215/44	. . . . . with aryl radicals attached to said nitrogen atoms
213/81	. . . . . Amides; Imides	215/46	. . . . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to said nitrogen atoms
213/82	. . . . . in position 3	215/48	. . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
213/83	. . . . Thioacids; Thioesters; Thioamides; Thioimides	215/50	. . . . attached in position 4
213/84	. . . . Nitriles	215/52	. . . . . with aryl radicals attached in position 2
213/85	. . . . . in position 3	215/54	. . . . attached in position 3
213/86	. . . . Hydrazides; Thio or imino analogues thereof	215/56	. . . . . with oxygen atoms in position 4
213/87	. . . . . in position 3	215/58	. with hetero atoms directly attached to the ring nitrogen atom
213/88	. . . . Nicotinoylhydrazones	215/60	. . N-oxides
213/89	. . with hetero atoms directly attached to the ring nitrogen atom	<b>217/00</b>	<b>Heterocyclic compounds containing isoquinoline or hydrogenated isoquinoline ring systems</b>
213/90	. having more than three double bonds between ring members or between ring members and non-ring members	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
<b>215/00</b>	<b>Heterocyclic compounds containing quinoline or hydrogenated quinoline ring systems</b>	217/04	. . with hydrocarbon or substituted hydrocarbon radicals attached to the ring nitrogen atom
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	217/06	. . with the ring nitrogen atom acylated by carboxylic or carbonic acids, or with sulfur or nitrogen analogues thereof, e.g. carbamates
215/04	. . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to the ring carbon atoms	217/08	. . with a hetero atom directly attached to the ring nitrogen atom
215/06	. . . having only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to the ring nitrogen atom	217/10	. . Quaternary compounds
215/08	. . . with acylated ring nitrogen atom	217/12	. with radicals, substituted by hetero atoms, attached to carbon atoms of the nitrogen-containing ring
215/10	. . . Quaternary compounds	217/14	. . other than aralkyl radicals
215/12	. . with substituted hydrocarbon radicals attached to ring carbon atoms	217/16	. . . substituted by oxygen atoms
215/14	. . . Radicals substituted by oxygen atoms	217/18	. . Aralkyl radicals
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	217/20	. . . with oxygen atoms directly attached to the aromatic ring of said aralkyl radical, e.g. papaverine
215/18	. . . Halogen atoms or nitro radicals	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
215/20	. . . Oxygen atoms ( <a href="#">quinophthalones C09B 25/00</a> )	217/24	. . Oxygen atoms
215/22	. . . . attached in position 2 or 4	217/26	. . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
215/227	. . . . . only one oxygen atom which is attached in position 2	<b>219/00</b>	<b>Heterocyclic compounds containing acridine or hydrogenated acridine ring systems</b>
		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	223/24	. . . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom
219/06	. . Oxygen atoms	223/26	. . . . . having a double bond between positions 10 and 11
219/08	. . Nitrogen atoms ( <a href="#">acridine dyes C09B 15/00</a> )	223/28	. . . . . having a single bond between positions 10 and 11
219/10	. . . attached in position 9	223/30	. . . . with hetero atoms directly attached to the ring nitrogen atom
219/12	. . . . Amino-alkyl-amino radicals attached in position 9	223/32	. . containing carbocyclic rings other than six-membered
219/14	. with hydrocarbon radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom	<b>225/00</b>	<b>Heterocyclic compounds containing rings of more than seven members having one nitrogen atom as the only ring hetero atom</b>
219/16	. with acyl radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom	<b>NOTE</b>	
<b>221/00</b>	<b>Heterocyclic compounds containing six-membered rings having one nitrogen atom as the only ring hetero atom, not provided for by groups <a href="#">C07D 211/00</a> - <a href="#">C07D 219/00</a></b>		Polymethyleneimines with at least five ring members and having only hydrogen atoms attached to the ring carbon atoms are classified in group <a href="#">C07D 295/00</a>
221/02	. condensed with carbocyclic rings or ring systems	225/02	. not condensed with other rings
221/04	. . Ortho- or peri-condensed ring systems	225/04	. condensed with carbocyclic rings or ring systems
221/06	. . . Ring systems of three rings	225/06	. . condensed with one six-membered ring
221/08	. . . . Aza-anthracenes ( <a href="#">acridine C07D 219/00</a> )	225/08	. . condensed with two six-membered rings
221/10	. . . . Aza-phenanthrenes	<b>227/00</b>	<b>Heterocyclic compounds containing rings having one nitrogen atom as the only ring hetero atom, according to more than one of groups <a href="#">C07D 203/00</a> - <a href="#">C07D 225/00</a></b>
221/12	. . . . . Phenanthridines	<b>NOTE</b>	
221/14	. . . . Aza-phenalenes, e.g. 1,8-naphthalimide		Polymethyleneimines with at least five ring members and having only hydrogen atoms attached to the ring carbon atoms are classified in group <a href="#">C07D 295/00</a>
221/16	. . . . containing carbocyclic rings other than six-membered	227/02	. with only hydrogen or carbon atoms directly attached to the ring nitrogen atom
221/18	. . . Ring systems of four or more rings	227/04	. . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to ring carbon atoms
221/20	. . Spiro-condensed ring systems	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
221/22	. . Bridged ring systems	227/08	. . . Oxygen atoms
221/24	. . . Camphidines	227/087	. . . . One doubly-bound oxygen atom in position 2, e.g. lactams
221/26	. . . Benzomorphans	227/093	. . . . Two doubly-bound oxygen atoms attached to the carbon atoms adjacent to the ring nitrogen atom, e.g. dicarboxylic acid imides
221/28	. . . Morphinans	227/10	. . . Nitrogen atoms not forming part of a nitro radical
<b>223/00</b>	<b>Heterocyclic compounds containing seven-membered rings having one nitrogen atom as the only ring hetero atom</b>	227/12	. with hetero atoms directly attached to the ring nitrogen atom
<b>NOTE</b>		<b>229/00</b>	<b>Heterocyclic compounds containing rings of less than five members having two nitrogen atoms as the only ring hetero atoms</b>
	Hexamethylene imines or 3-aza-bicyclo [3.2.2] nonanes, having only hydrogen atoms attached to the ring carbon atoms, are classified in <a href="#">C07D 295/00</a>	229/02	. containing three-membered rings
223/02	. not condensed with other rings	<b>231/00</b>	<b>Heterocyclic compounds containing 1,2-diazole or hydrogenated 1,2-diazole rings</b>
223/04	. . with only hydrogen atoms, halogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	231/02	. not condensed with other rings
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 ( <a href="#">halogen atoms C07D 223/04</a> )		
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		

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



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

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

241/34	. . . . . (Amino-pyrazine carbonamido) guanidines	245/02	. not condensed with other rings
241/36	. condensed with carbocyclic rings or ring systems	245/04	. condensed with carbocyclic rings or ring systems
241/38	. . with only hydrogen or carbon atoms directly attached to the ring nitrogen atoms	245/06	. . condensed with one six-membered ring
241/40	. . . Benzopyrazines	<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 C07D 229/00 - C07D 245/00</b>
241/42	. . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the hetero ring	247/02	. having the nitrogen atoms in positions 1 and 3
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	<b>249/00</b>	<b>Heterocyclic compounds containing five-membered rings having three nitrogen atoms as the only ring hetero atoms</b>
241/46	. . . Phenazines	249/02	. not condensed with other rings
241/48	. . . . with hydrocarbon radicals, substituted by nitrogen atoms, directly attached to the ring nitrogen atoms	249/04	. . 1,2,3-Triazoles; Hydrogenated 1,2,3-triazoles
241/50	. . with hetero atoms directly attached to ring nitrogen atoms	249/06	. . . with aryl radicals directly attached to ring atoms
241/52	. . . Oxygen atoms	249/08	. . 1,2,4-Triazoles; Hydrogenated 1,2,4-triazoles
241/54	. . . Nitrogen 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
<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 1,2	249/14	. . . . Nitrogen atoms
243/04	. having the nitrogen atoms in positions 1,3	249/16	. condensed with carbocyclic rings or ring systems
243/06	. having the nitrogen atoms in positions 1,4	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 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
<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>	251/26	. . . with only hetero atoms directly attached to ring carbon atoms
		251/28	. . . . Only halogen atoms, e.g. cyanuric chloride
		251/30	. . . . Only oxygen atoms
		251/32	. . . . . Cyanuric acid; Isocyanuric acid
		251/34	. . . . . Cyanuric or isocyanuric esters
		251/36	. . . . . having halogen atoms directly attached to ring nitrogen atoms
		251/38	. . . . Sulfur atoms
		251/40	. . . . Nitrogen atoms
		251/42	. . . . . One nitrogen atom

- 251/44 . . . . . with halogen atoms attached to the two other ring carbon atoms
- 251/46 . . . . . with oxygen or sulfur atoms attached to the two other ring carbon atoms
- 251/48 . . . . . Two nitrogen atoms
- 251/50 . . . . . with a halogen atom attached to the third ring carbon atom
- 251/52 . . . . . with an oxygen or sulfur atom attached to the third ring carbon atom
- 251/54 . . . . . Three nitrogen atoms
- 251/56 . . . . . Preparation of melamine
- 251/58 . . . . . from cyanamide, dicyanamide or calcium cyanamide
- 251/60 . . . . . from urea or from carbon dioxide and ammonia
- 251/62 . . . . . Purification of melamine
- 251/64 . . . . . Condensation products of melamine with aldehydes; Derivatives thereof (polycondensation products [C08G](#))
- 251/66 . . . . . Derivatives of melamine in which a hetero atom is directly attached to a nitrogen atom of melamine
- 251/68 . . . . . Triazinylamino stilbenes
- 251/70 . . . . . Other substituted melamines
- 251/72 . . . . . condensed with carbocyclic rings or ring systems

**253/00 Heterocyclic compounds containing six-membered rings having three nitrogen atoms as the only ring hetero atoms, not provided for by group [C07D 251/00](#)**

- 253/02 . . . . . not condensed with other rings
- 253/04 . . . 1,2,3-Triazines
- 253/06 . . . 1,2,4-Triazines
- 253/065 . . . having three double bonds between ring members or between ring members and non-ring members
- 253/07 . . . . with hetero atoms, or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 253/075 . . . . . Two hetero atoms, in positions 3 and 5
- 253/08 . . . . . condensed with carbocyclic rings or ring systems
- 253/10 . . . Condensed 1, 2,4-triazines; Hydrogenated condensed 1,2,4-triazines

**255/00 Heterocyclic compounds containing rings having three nitrogen atoms as the only ring hetero atoms, not provided for by groups [C07D 249/00](#) - [C07D 253/00](#)**

- 255/02 . . . . . not condensed with other rings
- 255/04 . . . . . condensed with carbocyclic rings or ring systems

**257/00 Heterocyclic compounds containing rings having four nitrogen atoms as the only ring hetero atoms**

- 257/02 . . . . . not condensed with other rings
- 257/04 . . . Five-membered rings
- 257/06 . . . . with nitrogen atoms directly attached to the ring carbon atom
- 257/08 . . . Six-membered rings
- 257/10 . . . . . condensed with carbocyclic rings or ring systems
- 257/12 . . . Six-membered rings having four nitrogen atoms

**259/00 Heterocyclic compounds containing rings having more than four nitrogen atoms as the only ring hetero atoms**

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

**261/00 Heterocyclic compounds containing 1,2-oxazole or hydrogenated 1,2-oxazole rings**

- 261/02 . . . . . not condensed with other rings
- 261/04 . . . having one double bond between ring members or between a ring member and a non-ring member
- 261/06 . . . having two or more double bonds between ring members or between ring members and non-ring members
- 261/08 . . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 261/10 . . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 261/12 . . . . . Oxygen atoms
- 261/14 . . . . . Nitrogen atoms
- 261/16 . . . . . Benzene-sulphonamido isoxazoles
- 261/18 . . . . Carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen
- 261/20 . . . . . condensed with carbocyclic rings or ring systems

**263/00 Heterocyclic compounds containing 1,3-oxazole or hydrogenated 1,3-oxazole rings**

- 263/02 . . . . . not condensed with other rings
- 263/04 . . . having no double bonds between ring members or between ring members and non-ring members
- 263/06 . . . . with hydrocarbon radicals, substituted by oxygen atoms, attached to ring carbon atoms
- 263/08 . . . having one double bond between ring members or between a ring member and a non-ring member
- 263/10 . . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 263/12 . . . . . with radicals containing only hydrogen and carbon atoms
- 263/14 . . . . . with radicals substituted by oxygen atoms
- 263/16 . . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 263/18 . . . . . Oxygen atoms
- 263/20 . . . . . attached in position 2
- 263/22 . . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to other ring carbon atoms
- 263/24 . . . . . with hydrocarbon radicals, substituted by oxygen atoms, attached to other ring carbon atoms
- 263/26 . . . . . with hetero atoms or acyl radicals directly attached to the ring nitrogen atom
- 263/28 . . . . . Nitrogen atoms not forming part of a nitro radical
- 263/30 . . . having two or three double bonds between ring members or between ring members and non-ring members



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

- 265/32 . . . with oxygen atoms directly attached to ring carbon atoms
- 265/33 . . . . Two oxygen atoms, in positions 3 and 5
- 265/34 . . condensed with carbocyclic rings
- 265/36 . . . condensed with one six-membered ring
- 265/38 . . . [b, e]-condensed with two six-membered rings
- 267/00 Heterocyclic compounds containing rings of more than six members having one nitrogen atom and one oxygen atom as the only ring hetero atoms**
- 267/02 . Seven-membered rings
- 267/04 . . having the hetero atoms in positions 1 and 2
- 267/06 . . having the hetero atoms in positions 1 and 3
- 267/08 . . having the hetero atoms in positions 1 and 4
- 267/10 . . . not condensed with other rings
- 267/12 . . . condensed with carbocyclic rings or ring systems
- 267/14 . . . . condensed with one six-membered ring
- 267/16 . . . . condensed with two six-membered rings
- 267/18 . . . . . [b, e]-condensed
- 267/20 . . . . . [b, f]-condensed
- 267/22 . Eight-membered rings
- 269/00 Heterocyclic compounds containing rings having one nitrogen atom and one oxygen atom as the only ring hetero atoms according to more than one of groups [C07D 261/00](#) - [C07D 267/00](#)**
- 269/02 . having the hetero atoms in positions 1 and 3
- 271/00 Heterocyclic compounds containing five-membered rings having two nitrogen atoms and one oxygen atom as the only ring hetero atoms**
- 271/02 . not condensed with other rings
- 271/04 . . 1,2,3-Oxadiazoles; Hydrogenated 1,2,3-oxadiazoles
- 271/06 . . 1,2,4-Oxadiazoles; Hydrogenated 1,2,4-oxadiazoles
- 271/07 . . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical
- 271/08 . . 1,2,5-Oxadiazoles; Hydrogenated 1,2,5-oxadiazoles
- 271/10 . . 1,3,4-Oxadiazoles; Hydrogenated 1,3,4-oxadiazoles
- 271/107 . . . with two aryl or substituted aryl radicals attached in positions 2 and 5
- 271/113 . . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical
- 271/12 . condensed with carbocyclic rings or ring systems
- 273/00 Heterocyclic compounds containing rings having nitrogen and oxygen atoms as the only ring hetero atoms, not provided for by groups [C07D 261/00](#) - [C07D 271/00](#)**
- 273/01 . having one nitrogen atom
- 273/02 . having two nitrogen atoms and only one oxygen atom
- 273/04 . . Six-membered rings
- 273/06 . . Seven-membered rings
- 273/08 . having two nitrogen atoms and more than one oxygen atom



**Heterocyclic compounds having nitrogen and sulfur as the only ring hetero atoms****275/00 Heterocyclic compounds containing 1,2-thiazole or hydrogenated 1,2-thiazole rings**

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

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

- 277/02 . not condensed with other rings
- 277/04 . . having no double bonds between ring members or between ring members and non-ring members
- 277/06 . . . with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 277/08 . . having one double bond between ring members or between a ring member and a non-ring member
- 277/10 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 277/12 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 277/14 . . . . Oxygen atoms
- 277/16 . . . . Sulfur atoms
- 277/18 . . . . Nitrogen atoms
- 277/20 . . having two or three double bonds between ring members or between ring members and non-ring members
- 277/22 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 277/24 . . . . Radicals substituted by oxygen atoms
- 277/26 . . . . Radicals substituted by sulfur atoms
- 277/28 . . . . Radicals substituted by nitrogen atoms
- 277/30 . . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 277/32 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 277/34 . . . . Oxygen atoms
- 277/36 . . . . Sulfur atoms
- 277/38 . . . . Nitrogen atoms
- 277/40 . . . . . Unsubstituted amino or imino radicals
- 277/42 . . . . . Amino or imino radicals substituted by hydrocarbon or substituted hydrocarbon radicals
- 277/44 . . . . . Acylated amino or imino radicals
- 277/46 . . . . . by carboxylic acids, or sulfur or nitrogen analogues thereof
- 277/48 . . . . . by radicals derived from carbonic acid, or sulfur or nitrogen analogues thereof, e.g. carbonylguanidines

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**279/00**

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- . . . . . Nitrogen atoms bound to hetero atoms (nitro radicals C07D 277/58)
- . . . . . to sulfur atoms, e.g. sulfonamides
- . . . . . Nitrogen and either oxygen or sulfur atoms
- . . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- . . . . . Nitro radicals
- . . . 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.  $\begin{array}{c} \text{---N} \\ | \\ \text{---C---}(\text{CH}_2)_m\text{---C}\equiv \\ | \\ \text{S} \\ | \\ \text{Z} \end{array}$  with m
- >= 0, Z being a singly or a doubly bound hetero atom
- . . . . . Z being doubly bound oxygen or doubly bound nitrogen, which nitrogen is part of a possibly substituted oximino radical
- . condensed with carbocyclic rings or ring-systems
- . . Benzothiazoles
- . . . with only hydrocarbon or substituted hydrocarbon radicals attached in position 2
- . . . . with aromatic rings or ring systems directly attached in position 2
- . . . 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
- . . . . . Sulfur atoms
- . . . . . 2-Mercaptobenzothiazole
- . . . . . Sulfur atoms substituted by carbon atoms
- . . . . . Sulfur atoms attached to a second hetero atom
- . . . . . to a sulfur atom
- . . . . . to a nitrogen atom
- . . . . . Nitrogen atoms
- . . Naphthothiazoles

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

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

- . 1,2-Thiazines; Hydrogenated 1,2-thiazines
- . 1,3-Thiazines; Hydrogenated 1,3-thiazines
- . . not condensed with other rings
- . . condensed with carbocyclic rings or ring systems
- . 1,4-Thiazines; Hydrogenated 1,4-thiazines
- . . not condensed with other rings
- . . condensed with carbocyclic rings or ring systems
- . . . condensed with one six-membered ring
- . . . [b, e]-condensed with two six-membered rings
- . . . . with hydrogen atoms directly attached to the ring nitrogen atom
- . . . . with carbon atoms directly attached to the ring nitrogen atom

279/24	. . . . . with hydrocarbon radicals, substituted by amino radicals, attached to the ring nitrogen atom	285/22	. . . . . condensed with one six-membered ring
279/26	. . . . . without other substituents attached to the ring system	285/24	. . . . . with oxygen atoms directly attached to the ring sulfur atom
279/28	. . . . . with other substituents attached to the ring system	285/26	. . . . . substituted in position 6 or 7 by sulfamoyl or substituted sulfamoyl radicals
279/30	. . . . . with acyl radicals attached to the ring nitrogen atom	285/28	. . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached in position 3
279/32	. . . . . with hetero atoms directly attached to the ring nitrogen atom	285/30	. . . . . with hydrocarbon radicals, substituted by hetero atoms attached in position 3
279/34	. . . . . with hetero atoms directly attached to the ring sulfur atom	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
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	285/34	. . . 1,3,5-Thiadiazines; Hydrogenated 1,3,5-thiadiazines
281/04	. . having the hetero atoms in positions 1 and 4	285/36	. Seven-membered rings
281/06	. . . not condensed with other rings	285/38	. Eight-membered rings
281/08	. . . condensed with carbocyclic rings or ring systems	<b>291/00</b>	<b>Heterocyclic compounds containing rings having nitrogen, oxygen and sulfur atoms as the only ring hetero atoms</b>
281/10	. . . . . condensed with one six-membered ring	291/02	. not condensed with other rings
281/12	. . . . . condensed with two six-membered rings	291/04	. . Five-membered rings
281/14	. . . . . [b, e]-condensed	291/06	. . Six-membered rings
281/16	. . . . . [b, f]-condensed	291/08	. condensed with carbocyclic rings or ring systems
281/18	. Eight-membered rings	<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>
<b>283/00</b>	<b>Heterocyclic compounds containing rings having one nitrogen atom and one sulfur atom as the only ring hetero atoms, according to more than one of groups <a href="#">C07D 275/00</a> - <a href="#">C07D 281/00</a></b>	293/02	. not condensed with other rings
283/02	. having the hetero atoms in positions 1 and 3	293/04	. . Five-membered 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>	293/06	. . . Selenazoles; Hydrogenated selenazoles
285/01	. Five-membered rings	293/08	. . Six-membered rings
285/02	. . Thiadiazoles; Hydrogenated thiadiazoles	293/10	. condensed with carbocyclic rings or ring systems
285/04	. . . not condensed with other rings	293/12	. . Selenazoles; Hydrogenated selenazoles
285/06	. . . . 1,2,3-Thiadiazoles; Hydrogenated 1,2,3-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>
285/08	. . . . 1,2,4-Thiadiazoles; Hydrogenated 1,2,4-thiadiazoles	295/02	. containing only hydrogen and carbon atoms in addition to the ring hetero elements
285/10	. . . . 1,2,5-Thiadiazoles; Hydrogenated 1,2,5-thiadiazoles	295/023	. . Preparation; Separation; Stabilisation; Use of additives
285/12	. . . . 1,3,4-Thiadiazoles; Hydrogenated 1,3,4-thiadiazoles	295/027	. . containing only one hetero ring
285/125	. . . . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical	295/03	. . . with the ring nitrogen atoms directly attached to acyclic carbon atoms
285/13	. . . . . Oxygen atoms	295/033	. . . with the ring nitrogen atoms directly attached to carbocyclic rings
285/135	. . . . . Nitrogen atoms	295/037	. . with quaternary ring nitrogen atoms
285/14	. . . condensed with carbocyclic rings or ring systems	295/04	. with substituted hydrocarbon radicals attached to ring nitrogen atoms
285/15	. Six-membered rings	295/06	. . substituted by halogen atoms or nitro radicals
285/16	. . Thiadiazines; Hydrogenated thiadiazines	295/067	. . . with the ring nitrogen atoms and the substituents attached to the same carbon chain, which is not interrupted by carbocyclic rings
285/18	. . . 1,2,4-Thiadiazines; Hydrogenated 1,2,4-thiadiazines		
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
- 295/08 . . substituted by singly bound oxygen or sulfur atoms
- 295/084 . . . with the ring nitrogen atoms and the oxygen or sulfur atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/088 . . . . to an acyclic saturated chain
- 295/092 . . . . with aromatic radicals attached to the chain
- 295/096 . . . with the ring nitrogen atoms and the oxygen or sulfur atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/10 . . substituted by doubly bound oxygen or sulfur atoms ([acylated ring nitrogen atoms C07D 295/16](#))
- 295/104 . . . with the ring nitrogen atoms and the doubly bound oxygen or sulfur atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/108 . . . . to an acyclic saturated chain
- 295/112 . . . with the ring nitrogen atoms and the doubly bound oxygen or sulfur atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/116 . . . . with the doubly bound oxygen or sulfur atoms directly attached to a carbocyclic ring
- 295/12 . . substituted by singly or doubly bound nitrogen atoms ([nitro radicals C07D 295/06](#))
- 295/125 . . . with the ring nitrogen atoms and the substituent nitrogen atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/13 . . . . to an acyclic saturated chain
- 295/135 . . . with the ring nitrogen atoms and the substituent nitrogen atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/14 . . substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 295/145 . . . with the ring nitrogen atoms and the carbon atoms with three bonds to hetero atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/15 . . . . to an acyclic saturated chain
- 295/155 . . . with the ring nitrogen atoms and the carbon atoms with three bonds to hetero atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/16 . . acylated on ring nitrogen atoms
- 295/18 . . by radicals derived from carboxylic acids, or sulfur or nitrogen analogues thereof
- 295/182 . . . Radicals derived from carboxylic acids
- 295/185 . . . . from aliphatic carboxylic acids
- 295/192 . . . . from aromatic carboxylic acids
- 295/194 . . . Radicals derived from thio- or thiono carboxylic acids
- 295/195 . . . Radicals derived from nitrogen analogues of carboxylic acids
- 295/20 . . by radicals derived from carbonic acid, or sulfur or nitrogen analogues thereof

- 295/205 . . . Radicals derived from carbonic acid
- 295/21 . . . Radicals derived from sulfur analogues of carbonic acid
- 295/215 . . . Radicals derived from nitrogen analogues of carbonic acid
- 295/22 . . with hetero atoms directly attached to ring nitrogen atoms
- 295/24 . . Oxygen atoms
- 295/26 . . Sulfur atoms
- 295/28 . . Nitrogen atoms
- 295/30 . . . non-acylated
- 295/32 . . . acylated with carboxylic or carbonic acids, or their nitrogen or sulfur analogues

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

##### **301/00 Preparation of oxiranes**

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

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

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

- 303/16 . . . by esterified hydroxyl radicals
- 303/17 . . . . containing oxirane rings condensed with carbocyclic ring systems having three or more relevant rings
- 303/18 . . . by etherified hydroxyl radicals
- 303/20 . . . . Ethers with hydroxy compounds containing no oxirane rings
- 303/22 . . . . with monohydroxy compounds
- 303/23 . . . . . Oxiranylmethyl ethers of compounds having one hydroxy group bound to a six-membered aromatic ring, the oxiranylmethyl radical not being further substituted, i.e.
- $$\begin{array}{c} \text{CH}_2-\text{CH}-\text{CH}_2-\text{O}-\text{Aryl} \\ \quad \quad \quad \diagup \quad \diagdown \\ \quad \quad \quad \text{O} \end{array}$$
- 303/24 . . . . with polyhydroxy compounds
- 303/26 . . . . . having one or more free hydroxyl radicals
- 303/27 . . . . . having all hydroxyl radicals etherified with oxirane containing compounds
- 303/28 . . . . Ethers with hydroxy compounds containing oxirane rings
- 303/30 . . . . . Ethers of oxirane-containing polyhydroxy compounds in which all hydroxyl radicals are etherified with oxirane-containing hydroxy compounds
- 303/31 . . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings
- 303/32 . . . by aldehydo- or ketonic radicals
- 303/34 . . with hydrocarbon radicals substituted by sulfur, selenium or tellurium atoms
- 303/36 . . with hydrocarbon radicals substituted by nitrogen atoms ([nitro](#), [nitroso radicals C07D 303/08](#))
- 303/38 . . with hydrocarbon radicals substituted by carbon atoms having three bonds to heteroatoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 303/40 . . . by ester radicals
- 303/42 . . . . Acyclic compounds having a chain of seven or more carbon atoms, e.g. epoxidised fats
- 303/44 . . . . Esterified with oxirane-containing hydroxy compounds
- 303/46 . . . by amide or nitrile radicals
- 303/48 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms; with at the most one bond to halogen, directly attached to ring carbon atoms, e.g. ester or nitrile radicals

**305/00 Heterocyclic compounds containing four-membered rings having one oxygen atoms as the only ring hetero atoms**

- 305/02 . not condensed with other rings
- 305/04 . . having no double bonds between ring members or between ring members and non-ring members
- 305/06 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring atoms
- 305/08 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring atoms

- 305/10 . . having one or more double bonds between ring members or between ring members and non-ring members
- 305/12 . . . Beta-lactones
- 305/14 . condensed with carbocyclic rings or ring systems
- 307/00 Heterocyclic compounds containing five-membered rings having one oxygen atom as the only ring hetero atom**
- 307/02 . not condensed with other rings
- 307/04 . . having no double bonds between ring members or between ring members and non-ring members
- 307/06 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- 307/08 . . . . Preparation of tetrahydrofuran
- 307/10 . . . with substituted hydrocarbon radicals attached to ring carbon atoms
- 307/12 . . . . Radicals substituted by oxygen atoms
- 307/14 . . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
- 307/16 . . . . Radicals substituted by carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals
- 307/18 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 307/20 . . . . Oxygen atoms
- 307/22 . . . . Nitrogen atoms not forming part of a nitro radical
- 307/24 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 307/26 . . having one double bond between ring members or between a ring member and a non-ring member
- 307/28 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 307/30 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 307/32 . . . . Oxygen atoms
- 307/33 . . . . . in position 2, the oxygen atom being in its keto or unsubstituted enol form
- 307/34 . . having two or three double bonds between ring members or between ring members and non-ring members
- 307/36 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- 307/38 . . . with substituted hydrocarbon radicals attached to ring carbon atoms
- 307/40 . . . . Radicals substituted by oxygen atoms
- 307/42 . . . . . Singly bound oxygen atoms ([two oxygen atoms bound to the same carbon atom C07D 307/46](#))
- 307/44 . . . . . Furfuryl alcohol
- 307/45 . . . . . Oxygen atoms acylated by a cyclopropane containing carboxylic acyl radical, e.g. chrysanthemumates
- 307/46 . . . . . Doubly bound oxygen atoms, or two oxygen atoms singly bound to the same carbon atom



307/48	. . . . . Furfural	307/90	. . . with an oxygen atom in position 1 and a nitrogen atom in position 3, or <u>vice versa</u>
307/50	. . . . . Preparation from natural products	307/91	. . Dibenzofurans; Hydrogenated dibenzofurans
307/52	. . . Radicals substituted by nitrogen atoms not forming part of a nitro radical	307/92	. . Naphthofurans; Hydrogenated naphthofurans
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	307/93	. . condensed with a ring other than six-membered
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	307/935	. . . Not further condensed cyclopenta [b] furans or hydrogenated cyclopenta [b] furans
307/58	. . . . One oxygen atom, e.g. butenolide	307/937	. . . . with hydrocarbon or substituted hydrocarbon radicals directly attached in position 2, e.g. prostacyclins
307/60	. . . . Two oxygen atoms, e.g. succinic anhydride	307/94	. . spiro-condensed with carbocyclic rings or ring systems, e.g. griseofulvins
307/62	. . . . Three oxygen atoms, e.g. ascorbic acid	<b>309/00</b>	<b>Heterocyclic compounds containing six-membered rings having one oxygen atom as the only ring hetero atom, not condensed with other rings</b>
307/64	. . . . Sulfur atoms	309/02	. . having no double bonds between ring members or between ring members and non-ring members
307/66	. . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 307/70</a> )	309/04	. . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
307/68	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	309/06	. . . Radicals substituted by oxygen atoms
307/70	. . . . Nitro radicals	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
307/71	. . . . . attached in position 5	309/10	. . . Oxygen atoms
307/72	. . . . . with hydrocarbon radicals, substituted by nitrogen-containing radicals, attached in position 2	309/12	. . . . only hydrogen atoms and one oxygen atom directly attached to ring carbon atoms, e.g. tetrahydropyranyl ethers
307/73	. . . . . by amino or imino, or substituted amino or imino radicals	309/14	. . . Nitrogen atoms not forming part of a nitro radical ( <a href="#">nitro radical C07D 309/08</a> )
307/74	. . . . . by hydrazino or hydrazono or such substituted radicals	309/16	. . having one double bond between ring members or between a ring member and a non-ring member
307/75	. . . . . having carboxylic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. hydrazides	309/18	. . containing only hydrogen and carbon atoms in addition to the ring hetero atom
307/76	. . . . . having carbonic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. semicarbazides	309/20	. . with hydrogen atoms and substituted hydrocarbon radicals directly attached to ring carbon atoms
307/77	. . ortho- or peri-condensed with carbocyclic rings or ring systems	309/22	. . . Radicals substituted by oxygen atoms
307/78	. . Benzo [b] furans; Hydrogenated benzo [b] furans	309/24	. . . . Methylol radicals
307/79	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals directly attached to carbon atoms of the hetero ring	309/26	. . . . Carboxaldehyde radicals
307/80	. . . . Radicals substituted by oxygen atoms	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
307/81	. . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical	309/30	. . . Oxygen atoms, e.g. delta-lactones
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	309/32	. . having two double bonds between ring members or between ring members and non-ring members
307/83	. . . . Oxygen atoms	309/34	. . having three or more double bonds between ring members or between ring members and non-ring members
307/84	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	309/36	. . with oxygen atoms directly attached to ring carbon atoms
307/85	. . . . . attached in position 2	309/38	. . . one oxygen atom in position 2 or 4, e.g. pyrones
307/86	. . . with an oxygen atom directly attached in position 7	309/40	. . . Oxygen atoms attached in positions 3 and 4, e.g. maltol
307/87	. . Benzo [c] furans; Hydrogenated benzo [c] furans	<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>
307/88	. . . with one oxygen atom directly attached in position 1 or 3	311/02	. . ortho- or peri-condensed with carbocyclic rings or ring systems
307/885	. . . . 3,3-Diphenylphthalides	311/04	. . Benzo[b]pyrans, not hydrogenated in the carbocyclic ring
307/89	. . . with two oxygen atoms directly attached in positions 1 and 3		



311/06	. . . with oxygen or sulfur atoms directly attached in position 2	311/72	. . . . . 3,4-Dihydro-derivatives having in position 2 at least one methyl radical and in position 6 an oxygen atom, e.g. tocopherols
311/08	. . . . not hydrogenated in the hetero ring		
311/10	. . . . . unsubstituted		
311/12	. . . . . substituted in position 3 and unsubstituted in position 7	311/74	. . Benzo[b]pyrans, hydrogenated in the carbocyclic ring
311/14	. . . . . substituted in position 6 and unsubstituted in position 7	311/76	. . Benzo[c]pyrans
311/16	. . . . . substituted in position 7	311/78	. . Ring systems having three or more relevant rings
311/18	. . . . . substituted otherwise than in position 3 or 7 (substituted in position 4 by oxygen or sulfur <a href="#">C07D 311/42</a> )	311/80	. . . Dibenzopyrans; Hydrogenated dibenzopyrans
311/20	. . . . hydrogenated in the hetero ring	311/82	. . . . Xanthenes
311/22	. . . with oxygen or sulfur atoms directly attached in position 4	311/84	. . . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 9
311/24	. . . . . 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	311/86	. . . . . Oxygen atoms, e.g. xanthenes
311/26	. . . . with aromatic rings attached in position 2 or 3	311/88	. . . . . Nitrogen atoms
311/28	. . . . . with aromatic rings attached in position 2 only	311/90	. . . . . with hydrocarbon radicals substituted by amino radicals, directly attached in position 9
311/30	. . . . . not hydrogenated in the hetero ring, e.g. flavones	311/92	. . . Naphthopyrans; Hydrogenated naphthopyrans
311/32	. . . . . 2,3-Dihydro derivatives, e.g. flavanones	311/94	. . condensed with rings other than six-membered
311/34	. . . . . with aromatic rings attached in position 3 only	311/96	. . spiro-condensed with carbocyclic rings or ring systems
311/36	. . . . . not hydrogenated in the hetero ring, e.g. isoflavones	<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>
311/38	. . . . . 2,3-Dihydro derivated, e.g. isoflavanones	313/02	. . Seven-membered rings
311/40	. . . . . Separation, e.g. from natural material; Purification	313/04	. . not condensed with other rings
311/42	. . . with oxygen or sulfur atoms in positions 2 and 4	313/06	. . condensed with carbocyclic rings or ring systems
311/44	. . . . with one hydrogen atom in position 3	313/08	. . . condensed with one six-membered ring
311/46	. . . . . unsubstituted in the carbocyclic ring	313/10	. . . condensed with two six-membered rings
311/48	. . . . . with two such benzopyran radicals linked together by a carbon chain	313/12	. . . . [b,e]-condensed
311/50	. . . . . with elements other than carbon and hydrogen in position 3	313/14	. . . . [b,f]-condensed
311/52	. . . . . Enol-esters or -ethers, or sulfur analogues thereof	313/16	. . Eight-membered rings
311/54	. . . . . substituted in the carbocyclic ring	313/18	. . not condensed with other rings
311/56	. . . . without hydrogen atoms in position 3	313/20	. . condensed with carbocyclic rings or ring systems
311/58	. . . other than with oxygen or sulfur atoms in positions 2 or 4	<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>
311/60	. . . . with aryl radicals attached in position 2	<b>317/00</b>	<b>Heterocyclic compounds containing five-membered rings having two oxygen atoms as the only ring hetero atoms</b>
311/62	. . . . . with oxygen atoms directly attached in position 3, e.g. anthocyanidins	317/02	. . having the hetero atoms in positions 1 and 2
311/64	. . . . with oxygen atoms directly attached in position 8	317/04	. . 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	317/06	. . condensed with carbocyclic rings or ring systems
311/68	. . . . with nitrogen atoms directly attached in position 4	317/08	. . having the hetero atoms in positions 1 and 3
311/70	. . . . with two hydrocarbon radicals attached in position 2 and elements other than carbon and hydrogen in position 6	317/10	. . not condensed with other rings
		317/12	. . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
		317/14	. . . with substituted hydrocarbon radicals attached to ring carbon atoms
		317/16	. . . . Radicals substituted by halogen atoms or nitro radicals
		317/18	. . . . Radicals substituted by singly bound oxygen or sulfur atoms
		317/20	. . . . . Free hydroxyl or mercaptan
		317/22	. . . . . etherified
		317/24	. . . . . esterified

317/26	. . . . Radicals substituted by doubly bound oxygen or sulfur atoms or by two such atoms singly bound to the same carbon atom	319/16	. . . condensed with one six-membered ring
317/28	. . . . Radicals substituted by nitrogen atoms (by <a href="#">nitro radicals C07D 317/16</a> )	319/18	. . . . Ethylenedioxybenzenes, not substituted on the hetero ring
317/30	. . . . Radicals substituted by carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals	319/20	. . . . with substituents attached to the hetero ring
317/32	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms	319/22	. . . condensed with one naphthalene or hydrogenated naphthalene ring system
317/34	. . . . Oxygen atoms	319/24	. . . [b,e]-condensed with two six-membered rings
317/36	. . . . Alkylene carbonates; Substituted alkylene carbonates	<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>
317/38	. . . . . Ethylene carbonate	321/02	. Seven-membered rings
317/40	. . . . . Vinylene carbonate; Substituted vinylene carbonates	321/04	. . not condensed with other rings
317/42	. . . . Halogen atoms or nitro radicals	321/06	. . . 1,3-Dioxepines; Hydrogenated 1,3-dioxepines
317/44	. . ortho- or peri-condensed with carbocyclic rings or ring systems	321/08	. . . 1,4-Dioxepines; Hydrogenated 1,4-dioxepines
317/46	. . . condensed with one six-membered ring	321/10	. . condensed with carbocyclic rings or ring systems
317/48	. . . . Methyleneedioxybenzenes or hydrogenated methylenedioxybenzenes unsubstituted on the hetero ring	321/12	. Eight-membered rings
317/50	. . . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to atoms of the carbocyclic ring	<b>323/00</b>	<b>Heterocyclic compounds containing more than two oxygen atoms as the only ring hetero atoms</b>
317/52	. . . . . Radicals substituted by halogen atoms or nitro radicals	323/02	. Five-membered rings
317/54	. . . . . Radicals substituted by oxygen atoms	323/04	. Six-membered rings
317/56	. . . . . Radicals substituted by sulfur atoms	323/06	. . Trioxane
317/58	. . . . . Radicals substituted by nitrogen atoms (by <a href="#">nitro radicals C07D 317/52</a> )	<b>325/00</b>	<b>Heterocyclic compounds containing rings having oxygen as the only ring hetero atoms according to more than one of the main groups <a href="#">C07D 303/00</a> - <a href="#">C07D 323/00</a></b>
317/60	. . . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals	<b>327/00</b>	<b>Heterocyclic compounds containing rings having oxygen and sulfur atoms as the only ring hetero atoms</b>
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	327/02	. one oxygen atom and one sulfur atom
317/64	. . . . . Oxygen atoms	327/04	. . Five-membered rings
317/66	. . . . . Nitrogen atoms not forming part of a nitro radical	327/06	. . Six-membered rings
317/68	. . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	327/08	. . . [b,e]-condensed with two six-membered carbocyclic rings
317/70	. . . condensed with ring systems containing two or more relevant rings	327/10	. two oxygen atoms and one sulfur atom, e.g. cyclic sulfates
317/72	. . spiro-condensed with carbocyclic rings	<b>329/00</b>	<b>Heterocyclic compounds containing rings having oxygen and selenium or oxygen and tellurium atoms as the only ring hetero atoms</b>
<b>319/00</b>	<b>Heterocyclic compounds containing six-membered rings having two oxygen atoms as the only ring hetero atoms</b>	<b><u>Heterocyclic compounds having sulfur, selenium or tellurium as the only ring hetero atoms</u></b>	
319/02	. 1,2-Dioxanes; Hydrogenated 1,2-dioxanes	<b>331/00</b>	<b>Heterocyclic compounds containing rings of less than five members, having one sulfur atom as the only ring hetero atom</b>
319/04	. 1,3-Dioxanes; Hydrogenated 1,3-dioxanes	331/02	. Three-membered rings
319/06	. . not condensed with other rings	331/04	. Four-membered rings
319/08	. . condensed with carbocyclic rings or ring systems	<b>333/00</b>	<b>Heterocyclic compounds containing five-membered rings having one sulfur atom as the only ring hetero atom</b>
319/10	. 1,4-Dioxanes; Hydrogenated 1,4-dioxanes	333/02	. not condensed with other rings
319/12	. . not condensed with other rings	333/04	. . not substituted on the ring sulfur
319/14	. . condensed with carbocyclic rings or ring systems	333/06	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring carbon atoms
		333/08	. . . . Hydrogen atoms or radicals containing only hydrogen and carbon atoms
		333/10	. . . . . Thiophene
		333/12	. . . . Radicals substituted by halogen atoms or nitro or nitroso radicals

- 333/14 . . . . Radicals substituted by singly bound hetero atoms other than halogen
- 333/16 . . . . . by oxygen atoms
- 333/18 . . . . . by sulfur atoms
- 333/20 . . . . . by nitrogen atoms ([nitro, nitroso radicals C07D 333/12](#))
- 333/22 . . . . Radicals substituted by doubly bound hetero atoms, or by two hetero atoms other than halogen singly bound to the same carbon atom
- 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
- 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
- 333/28 . . . . Halogen atoms
- 333/30 . . . . Hetero atoms other than halogen
- 333/32 . . . . . Oxygen atoms
- 333/34 . . . . . Sulfur atoms
- 333/36 . . . . . Nitrogen atoms ([nitro, nitroso radicals C07D 333/42](#))
- 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 [2]
- 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**

335/02

335/04

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335/08

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**337/00**

337/02

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337/08

337/10

337/12

337/14

337/16

**339/00**

339/02

339/04

339/06

339/08

**341/00****343/00****345/00****347/00****Heterocyclic compounds containing six-membered rings having one sulfur atom as the only ring hetero atom**

- . not condensed with other rings
- . condensed with carbocyclic rings or ring systems
  - . . Benzothiopyrans; Hydrogenated benzothiopyrans
  - . . Naphthothiopyrans; Hydrogenated naphthothiopyrans
  - . . Dibenzothiopyrans; Hydrogenated dibenzothiopyrans
- . . . Thioxanthenes
  - . . . . 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
- . . . . . Oxygen atoms, e.g. thioxanthenes
- . . . . . Nitrogen atoms
- . . . . with hydrocarbon radicals, substituted by amino radicals, directly attached in position 9

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

- . Seven-membered rings
  - . . not condensed with other rings
  - . . condensed with carbocyclic rings or ring systems
  - . . . condensed with one six-membered ring
  - . . . condensed with two six-membered rings
  - . . . . [b,e]-condensed
  - . . . . [b,f]-condensed
- . Eight-membered rings

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

- . Five-membered rings
  - . . having the hetero atoms in position 1,2, e.g. lipoic acid
  - . . having the hetero atoms in position 1,3, e.g. cyclic dithiocarbonates
- . Six-membered rings

**Heterocyclic compounds containing rings having three or more sulfur atoms as the only ring hetero atoms****Heterocyclic compounds containing rings having sulfur and selenium or sulfur and tellurium atoms as the only ring hetero atoms****Heterocyclic compounds containing rings having selenium or tellurium atoms as the only ring hetero atoms****Heterocyclic compounds containing rings having halogen atoms as ring hetero atoms****Heterocyclic compounds containing two or more hetero rings****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****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 401/00

(continued)

[C07D 203/00-C07D 347/00](#), neither condensed among themselves nor condensed with a common carbocyclic ring or ring system.

- 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

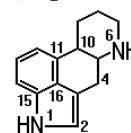
#### Heterocyclic compounds containing condensed hetero ring systems

##### NOTES

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

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

- 451/02 . containing not further condensed 8-azabicyclo [3.2.1] octane or 3-oxa-9-azatricyclo [3.3.1.0<2,4>] nonane ring systems, e.g. tropane; Cyclic acetals thereof
- 451/04 . . with hetero atoms directly attached in position 3 of the 8-azabicyclo [3.2.1] octane or in position 7 of the 3-oxa-9-azatricyclo [3.3.1.0<2,4>] nonane ring system
- 451/06 . . . Oxygen atoms
- 451/08 . . . . Diarylmethoxy radicals
- 451/10 . . . . acylated by aliphatic or araliphatic carboxylic acids, e.g. atropine, scopolamine
- 451/12 . . . . acylated by aromatic or heteroaromatic carboxylic acids, e.g. cocaine
- 451/14 . containing 9-azabicyclo [3.3.1] nonane ring systems, e.g. granatane, 2-aza-adamantane; Cyclic acetals thereof
- 453/00 Heterocyclic compounds containing quinuclidine or iso-quinuclidine ring systems, e.g. quinine alkaloids**
- 453/02 . containing not further condensed quinuclidine ring systems
- 453/04 . . having a quinolyl-4, a substituted quinolyl-4 or a alkylendioxy-quinolyl-4 radical linked through only one carbon atom, attached in position 2, e.g. quinine
- 453/06 . containing isoquinuclidine ring systems
- 455/00 Heterocyclic compounds containing quinolizine ring systems, e.g. emetine alkaloids, protoberberine; Alkylendioxy derivatives of dibenzo [a, g] quinolizines, e.g. berberine**
- 455/02 . containing not further condensed quinolizine ring systems
- 455/03 . containing quinolizine ring systems directly condensed with at least one six-membered carbocyclic ring, e.g. protoberberine; Alkylendioxy derivatives of dibenzo [a, g] quinolizines, e.g. berberine
- 455/04 . . containing a quinolizine ring system condensed with only one six-membered carbocyclic ring, e.g. julolidine
- 455/06 . . . containing benzo [a] quinolizine ring systems
- 455/08 . . . . having an isoquinolyl-1, a substituted isoquinolyl-1 or an alkylendioxyisoquinolyl-1 radical linked through only one carbon atom, attached in position 2, e.g. emetine
- 457/00 Heterocyclic compounds containing indolo [4, 3-f, g] quinoline ring systems, e.g. derivatives of ergoline, of the formula:**



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

- 457/02 . with hydrocarbon or substituted hydrocarbon radicals, attached in position 8
- 457/04 . with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 8
- 457/06 . . Lysergic acid amides

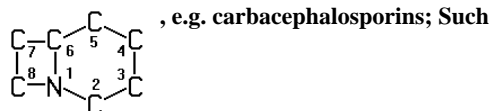


- 457/08 . . . in which the amide nitrogen is a member of a heterocyclic ring
- 457/10 . with hetero atoms directly attached in position 8
- 457/12 . . Nitrogen atoms
- 457/14 . containing indolo [4, 3-f, g] quinoline ring systems condensed with carbocyclic rings or ring systems

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

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

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



**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 (carbacephalosporins C07D 463/00)
- 471/06 . . Peri-condensed systems
- 471/08 . . Bridged systems
- 471/10 . . Spiro-condensed systems
- 471/12 . in which the condensed system contains three hetero rings

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

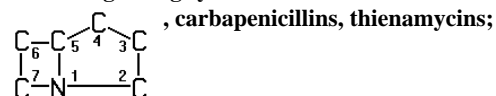
**473/00 Heterocyclic compounds containing purine ring systems**

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

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

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

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



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

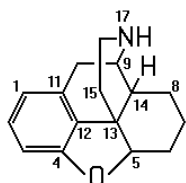
- 477/02 . Preparation (by microbiological processes C12P 17/18)
- 477/04 . . by forming the ring or condensed ring systems

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

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

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

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



- 489/02 . with oxygen atoms attached in positions 3 and 6, e.g. morphine, morphinone
- 489/04 . . Salts; Organic complexes
- 489/06 . with a hetero atom directly attached in position 14

- 489/08 . . Oxygen atom
- 489/09 . containing 4aH-8, 9 c-Iminoethano- phenanthro [4, 5-b, c, d] furan ring systems condensed with carbocyclic rings or ring systems
- 489/10 . . with a bridge between positions 6 and 14
- 489/12 . . . the bridge containing only two carbon atoms

**491/00 Heterocyclic compounds containing in the condensed ring system both one or more rings having oxygen atoms as the only ring hetero atoms and one or more rings having nitrogen atoms as the only ring hetero atoms, not provided for by groups C07D 451/00 - C07D 459/00, C07D 463/00, C07D 477/00 or C07D 489/00**

- 491/02 . in which the condensed system contains two hetero rings
- 491/04 . . Ortho-condensed systems
- 491/044 . . . with only one oxygen atom as ring hetero atom in the oxygen-containing ring
- 491/048 . . . . the oxygen-containing ring being five-membered
- 491/052 . . . . the oxygen-containing ring being six-membered
- 491/056 . . . with two or more oxygen atoms as ring hetero atoms in the oxygen-containing ring
- 491/06 . . Peri-condensed systems
- 491/08 . . Bridged systems
- 491/10 . . Spiro-condensed systems
- 491/107 . . . with only one oxygen atom as ring hetero atom in the oxygen-containing ring
- 491/113 . . . with two or more oxygen atoms as ring hetero atoms in the oxygen-containing ring
- 491/12 . in which the condensed system contains three hetero rings
- 491/14 . . Ortho-condensed systems (alkylenedioxy derivatives of dibenzo [a, g] quinolizines, e.g. berberine, C07D 455/03)
- 491/147 . . . the condensed system containing one ring with oxygen as ring hetero atom and two rings with nitrogen as ring hetero atom
- 491/153 . . . the condensed system containing two rings with oxygen as ring hetero atom and one ring with nitrogen as ring hetero atom
- 491/16 . . Peri-condensed systems
- 491/18 . . Bridged systems (3-oxa-9-azatricyclo [3.3.1.0<2,4>] nonane ring systems, e.g. scopolamine, C07D 451/00)
- 491/20 . . Spiro-condensed systems
- 491/22 . in which the condensed system contains four or more hetero rings

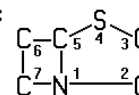
**493/00 Heterocyclic compounds containing oxygen atoms as the only ring hetero atoms in the condensed system**

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

- 493/20 . . Spiro-condensed systems
- 493/22 . . in which the condensed system contains four or more hetero rings
- 495/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having sulfur atoms as the only ring hetero atoms**
- 495/02 . . in which the condensed system contains two hetero rings
- 495/04 . . Ortho-condensed systems
- 495/06 . . Peri-condensed systems
- 495/08 . . Bridged systems
- 495/10 . . Spiro-condensed systems
- 495/12 . . in which the condensed system contains three hetero rings
- 495/14 . . Ortho-condensed systems
- 495/16 . . Peri-condensed systems
- 495/18 . . Bridged systems
- 495/20 . . Spiro-condensed systems
- 495/22 . . in which the condensed system contains four or more hetero rings
- 497/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having oxygen and sulfur atoms as the only ring hetero atoms**
- 497/02 . . in which the condensed system contains two hetero rings
- 497/04 . . Ortho-condensed systems
- 497/06 . . Peri-condensed systems
- 497/08 . . Bridged systems
- 497/10 . . Spiro-condensed systems
- 497/12 . . in which the condensed system contains three hetero rings
- 497/14 . . Ortho-condensed systems
- 497/16 . . Peri-condensed systems
- 497/18 . . Bridged systems
- 497/20 . . Spiro-condensed systems
- 497/22 . . in which the condensed system contains four or more hetero rings
- 498/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having nitrogen and oxygen atoms as the only ring hetero atoms (4-oxa-1-azabicyclo [3.2.0] heptanes, e.g. oxapenicillins C07D 503/00; 5-oxa-1-azabicyclo [4.2.0] octanes, e.g. oxacephalosporins C07D 505/00; analogues thereof having ring oxygen atoms in other position C07D 507/00)**
- 498/02 . . in which the condensed system contains two hetero rings
- 498/04 . . Ortho-condensed systems
- 498/06 . . Peri-condensed systems
- 498/08 . . Bridged systems
- 498/10 . . Spiro-condensed systems
- 498/12 . . in which the condensed system contains three hetero rings
- 498/14 . . Ortho-condensed systems
- 498/16 . . Peri-condensed systems
- 498/18 . . Bridged systems
- 498/20 . . Spiro-condensed systems
- 498/22 . . in which the condensed system contains four or more hetero rings

**499/00**

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



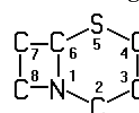
**Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring**

- 499/04 . Preparation
- 499/06 . . by forming the ring or condensed ring systems (by microbiological processes C12P 37/00)
- 499/08 . . Modification of a carboxyl radical directly attached in position 2, e.g. esterification
- 499/10 . . Modification of an amino radical directly attached in position 6
- 499/12 . . . Acylation
- 499/14 . . Preparation of salts
- 499/16 . . . of alkali or alkaline earth metals
- 499/18 . . Separation; Purification
- 499/20 . . . via salts with organic bases
- 499/21 . . with a nitrogen atom directly attached in position 6 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/22 . . Salts with organic bases; Complexes with organic compounds
- 499/24 . . . with acyclic or carbocyclic compounds containing amino radicals
- 499/26 . . . with heterocyclic compounds
- 499/28 . . with modified 2-carboxyl group
- 499/30 . . . Acid anhydride
- 499/32 . . . Esters
- 499/34 . . . Thioacid; Esters thereof
- 499/36 . . . . O-esters
- 499/38 . . . . S-esters
- 499/40 . . . Amides; Hydrazides; Azides
- 499/42 . . Compounds with a free primary amino radical attached in position 6
- 499/44 . . Compounds with an amino radical acylated by carboxylic acids, attached in position 6
- 499/46 . . . with acyclic hydrocarbon radicals or such radicals substituted by carbocyclic or heterocyclic rings, attached to the carboxamido radical
- 499/48 . . . with a carbon chain, substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, attached to the carboxamido radical
- 499/50 . . . . substituted in beta-position to the carboxamido radical
- 499/52 . . . . . by oxygen or sulfur atoms
- 499/54 . . . . . by nitrogen atoms
- 499/56 . . . . . by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 499/58 . . . . . substituted in alpha-position to the carboxamido radical
- 499/60 . . . . . by oxygen atoms
- 499/62 . . . . . by sulfur atoms
- 499/64 . . . . . by nitrogen atoms

- 499/66 . . . . . with alicyclic rings as additional substituents on the carbon chain
- 499/68 . . . . . with aromatic rings as additional substituents on the carbon chain
- 499/70 . . . . . with hetero rings as additional substituents on the carbon chain
- 499/72 . . . . . by carbon atoms having three bonds to hetero atoms
- 499/74 . . . with carbocyclic rings directly attached to the carboxamido radical
- 499/76 . . . with hetero rings directly attached to the carboxamido radical
- 499/78 . . Compounds with an amino radical, acylated by carbonic acid, or by nitrogen or sulfur analogues thereof, attached in position 6
- 499/80 . . Compounds with a nitrogen-containing hetero ring, attached with the ring nitrogen atom in position 6
- 499/86 . . with only atoms other than nitrogen atoms directly attached in position 6 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/861 . . with a hydrocarbon radical or a substituted hydrocarbon radical, directly attached in position 6
- 499/865 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 6
- 499/87 . . Compounds being unsubstituted in position 3 or with substituents other than only two methyl radicals attached in position 3, and with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/88 . . Compounds with a double bond between positions 2 and 3 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/881 . . with a hydrogen atom or an unsubstituted hydrocarbon radical, attached in position 3
- 499/883 . . with a substituted hydrocarbon radical attached in position 3
- 499/887 . . with a hetero atom or a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 3
- 499/893 . . with a hetero ring or a condensed hetero ring system, directly attached in position 3
- 499/897 . . Compounds with substituents other than a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, directly attached in position 2
- 499/90 . . further condensed with carbocyclic rings or ring systems

**501/00**

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



, e.g. cephalosporins;

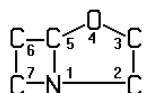
**Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring**

- 501/02 . Preparation
- 501/04 . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 501/06 . . . Acylation of 7-aminocephalosporanic acid
- 501/08 . . by forming the ring or condensed ring systems (by microbiological processes C12P 35/00)
- 501/10 . . . from compounds containing the penicillin ring system
- 501/12 . . Separation; Purification
- 501/14 . Compounds having a nitrogen atom directly attached in position 7
- 501/16 . . with a double bond between positions 2 and 3
- 501/18 . . . 7-Aminocephalosporanic or substituted 7-aminocephalosporanic acids
- 501/20 . . . 7-Acylaminocephalosporanic or substituted 7-acylaminocephalosporanic acids in which the acyl radicals are derived from carboxylic acids
- 501/22 . . . . with radicals containing only hydrogen and carbon atoms, attached in position 3
- 501/24 . . . . with hydrocarbon radicals, substituted by hetero atoms or hetero rings, attached in position 3
- 501/26 . . . . Methylene radicals, substituted by oxygen atoms; Lactones thereof with the 2-carboxyl group
- 501/28 . . . . . with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
- 501/30 . . . . . with the 7-amino-radical acylated by an araliphatic carboxylic acid
- 501/32 . . . . . with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
- 501/34 . . . . . with the 7-amino radical acylated by carboxylic acids containing hetero rings
- 501/36 . . . . Methylene radicals, substituted by sulfur atoms
- 501/38 . . . . Methylene radicals, substituted by nitrogen atoms; Lactams thereof with the 2-carboxyl group; Methylene radicals substituted by nitrogen-containing hetero rings attached by the ring nitrogen atom; Quaternary compounds thereof
- 501/40 . . . . . with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
- 501/42 . . . . . with the 7-amino radical acylated by an araliphatic carboxylic acid
- 501/44 . . . . . with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms



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

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



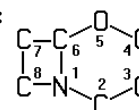
, e.g. oxapenicillins,

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

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

**505/00**

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



, e.g. oxacephalosporins;

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

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

**507/00**

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

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

**513/00**

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

- 513/02 . . . . . in which the condensed system contains two hetero rings
- 513/04 . . . . . Ortho-condensed systems
- 513/06 . . . . . Peri-condensed systems
- 513/08 . . . . . Bridged systems
- 513/10 . . . . . Spiro-condensed systems



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

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

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

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

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

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

- 519/02 . Ergot alkaloids of the cyclic peptide type
- 519/04 . Dimeric indole alkaloids, e.g. vincalencoblastine
- 519/06 . containing at least one condensed beta-lactam ring system, provided for by groups [C07D 463/00](#), [C07D 477/00](#) or [C07D 499/00](#) - [C07D 507/00](#), e.g. a penem or a cepham system

**521/00**

**Heterocyclic compounds containing unspecified hetero rings**

**NOTE**

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