

# CPC COOPERATIVE PATENT CLASSIFICATION

## C CHEMISTRY; METALLURGY

(NOTES omitted)

### CHEMISTRY

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

## C07D HETEROCYCLIC COMPOUNDS

### 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

203/20

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203/24

203/26

**205/00**

205/02

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205/09

205/095

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205/12

**207/00**

207/02

207/04

- . . . . by carbonic acid, or by sulfur or nitrogen analogues thereof, e.g. carbamates
- . . . with hetero atoms directly attached to the ring nitrogen atom
- . . . . Sulfur atoms
- . condensed with carbocyclic rings or ring systems

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

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

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

#### NOTE

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

- . with only hydrogen or carbon atoms directly attached to the ring nitrogen atom
- . . having no double bonds between ring members or between ring members and non-ring members

207/06	. . . with radicals, containing only hydrogen and carbon atoms, attached to ring carbon atoms	207/33	. . . . with substituted hydrocarbon radicals, directly attached to ring carbon atoms
207/08	. . . with hydrocarbon radicals, substituted by hetero atoms, attached to ring carbon atoms	207/333	. . . . Radicals substituted by oxygen or sulfur atoms
207/09	. . . . Radicals substituted by nitrogen atoms, not forming part of a nitro radical	207/335	. . . . 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	207/337	. . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
207/12	. . . . Oxygen or sulfur atoms	207/34	. . . with heteroatoms or with carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
207/14	. . . . Nitrogen atoms not forming part of a nitro radical	207/36	. . . . Oxygen or sulfur atoms
207/16	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals	207/38	. . . . 2-Pyrrolones
207/18	. . having one double bond between ring members or between a ring member and a non-ring member	207/40	. . . . 2,5-Pyrrolidine-diones
207/20	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	207/404	. . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms, e.g. succinimide
207/22	. . . 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	207/408	. . . . Radicals containing only hydrogen and carbon atoms attached to ring carbon atoms
207/24	. . . . Oxygen or sulfur atoms	207/412	. . . . Acyclic radicals containing more than six carbon atoms
207/26	. . . . 2-Pyrrolidones	207/416	. . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to other ring carbon atoms
207/263	. . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms	207/42	. . . . Nitro radicals
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
		209/04	. . Indoles; Hydrogenated indoles
		209/06	. . . Preparation of indole from coal-tar
		209/08	. . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to carbon atoms of the hetero ring
		209/10	. . . with substituted hydrocarbon radicals attached to carbon atoms of the hetero ring

209/12	. . . . Radicals substituted by oxygen atoms	209/80	. . [b, c]- or [b, d]-condensed
209/14	. . . . Radicals substituted by nitrogen atoms, not forming part of a nitro radical	209/82	. . . Carbazoles; Hydrogenated carbazoles
209/16	. . . . . Tryptamines	209/84	. . . . Separation, e.g. from tar; Purification
209/18	. . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals	209/86	. . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the ring system
209/20	. . . . . substituted additionally by nitrogen atoms, e.g. tryptophane	209/88	. . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the ring system
209/22	. . . . . with an aralkyl radical attached to the ring nitrogen atom	209/90	. . . Benzo [c, d] indoles; Hydrogenated benzo [c, d] indoles
209/24	. . . . . with an alkyl or cycloalkyl radical attached to the ring nitrogen atom	209/92	. . . . Naphthostyrils
209/26	. . . . . with an acyl radical attached to the ring nitrogen atom	209/94	. . . containing carbocyclic rings other than six-membered
209/28	. . . . . 1-(4-Chlorobenzoyl)-2-methyl-indolyl-3-acetic acid, substituted in position 5 by an oxygen or nitrogen atom; Esters thereof	209/96	. . Spiro-condensed ring systems
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	<b>211/00</b>	<b>Heterocyclic compounds containing hydrogenated pyridine rings, not condensed with other rings</b>
209/32	. . . . Oxygen atoms		<b>NOTES</b>
209/34	. . . . . in position 2		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;
209/36	. . . . . in position 3, e.g. adrenochrome		2. Piperidines having only hydrogen atoms attached to the ring carbon atoms are classified in <a href="#">C07D 295/00</a>
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	211/02	. Preparation by ring-closure or hydrogenation
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		
209/70	. . . containing carbocyclic rings other than six-membered		
209/72	. . . 4,7-Endo-alkylene-iso-indoles		
209/74	. . . . with an oxygen atom in position 1		
209/76	. . . . with oxygen atoms in positions 1 and 3		
209/78	. . . . with oxygen and nitrogen atoms in positions 1 and 3		

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	213/00	<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>
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	213/02	. having three double bonds between ring members or between ring members and non-ring members
211/38	. . . . . Halogen atoms or nitro 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
211/40	. . . . . Oxygen atoms	213/06	. . . containing only hydrogen and carbon atoms in addition to the ring nitrogen atom
211/42	. . . . . attached in position 3 or 5	213/08	. . . . . Preparation by ring-closure
211/44	. . . . . attached in position 4	213/09	. . . . . involving the use of ammonia, amines, amine salts, or nitriles
211/46	. . . . . having a hydrogen atom as the second substituent in position 4	213/10	. . . . . from acetaldehyde or cyclic polymers thereof
211/48	. . . . . having an acyclic carbon atom attached in position 4	213/12	. . . . . from unsaturated compounds
211/50	. . . . . Aryl radical	213/127	. . . . . Preparation from compounds containing pyridine rings
211/52	. . . . . having an aryl radical as the second substituent in position 4	213/133	. . . . . Preparation by dehydrogenation of hydrogenated pyridine compounds
211/54	. . . . . Sulfur atoms	213/14	. . . . . Preparation from compounds containing heterocyclic oxygen
211/56	. . . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 211/38</a> )	213/16	. . . . . containing only one pyridine ring
211/58	. . . . . attached in position 4	213/18	. . . . . Salts thereof
211/60	. . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals	213/20	. . . . . Quaternary compounds thereof
211/62	. . . . . attached in position 4	213/22	. . . . . containing two or more pyridine rings directly linked together, e.g. bipyridyl
211/64	. . . . . having an aryl radical as the second substituent in position 4	213/24	. . . with substituted hydrocarbon radicals attached to ring carbon atoms
211/66	. . . . . having a hetero atom as the second substituent in position 4	213/26	. . . . . Radicals substituted by halogen atoms or nitro radicals
211/68	. . having one double bond between ring members or between a ring member and a non-ring member	213/28	. . . . . Radicals substituted by singly-bound oxygen or sulfur atoms ( <a href="#">bound to the same carbon atom C07D 213/44</a> )
211/70	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	213/30	. . . . . Oxygen atoms
211/72	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, directly attached to ring carbon atoms	213/32	. . . . . Sulfur atoms
211/74	. . . . . Oxygen atoms	213/34	. . . . . to which a second heteroatom is attached
211/76	. . . . . attached in position 2 or 6	213/36	. . . . . Radicals substituted by singly-bound nitrogen atoms ( <a href="#">nitro radicals C07D 213/26</a> )
211/78	. . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	213/38	. . . . . having only hydrogen, hydrocarbon radicals attached to the substituent nitrogen atom
211/80	. . having two double bonds between ring members or between ring members and non-ring members	213/40	. . . . . Acylated substituent nitrogen atom
211/82	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	213/42	. . . . . having hetero atoms attached to the substituent nitrogen atom ( <a href="#">nitro radicals C07D 213/26</a> )
211/84	. . . 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	213/44	. . . . . Radicals substituted by doubly-bound oxygen, sulfur, or nitrogen atoms, or by two such atoms singly-bound to the same carbon atom
211/86	. . . . . Oxygen atoms	213/46	. . . . . Oxygen atoms
211/88	. . . . . attached in positions 2 and 6, e.g. glutarimide	213/48	. . . . . Aldehyde radicals
211/90	. . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	213/50	. . . . . Ketonic radicals
211/92	. with a hetero atom directly attached to the ring nitrogen atom	213/51	. . . . . Acetal radicals
211/94	. . Oxygen atom, e.g. piperidine N-oxide	213/52	. . . . . Sulfur atoms
211/96	. . Sulfur atom	213/53	. . . . . Nitrogen atoms
211/98	. . Nitrogen atom	213/54	. . . . . Radicals substituted by carbon atoms having three bonds to heteroatoms, with at the most one to halogen, e.g. ester or nitrile radicals
		213/55	. . . . . Acids; Esters

213/56	. . . . . Amides	213/89	. . with hetero atoms directly attached to the ring nitrogen atom
213/57	. . . . . Nitriles	213/90	. having more than three double bonds between ring members or between ring members and non-ring members
213/58	. . . . . Amidines		
213/59	. . . . . with at least one of the bonds being to sulfur	<b>215/00</b>	<b>Heterocyclic compounds containing quinoline or hydrogenated quinoline ring systems</b>
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	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
213/61	. . . . . Halogen atoms or nitro radicals	215/04	. . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to the ring carbon atoms
213/62	. . . . . Oxygen or sulfur atoms	215/06	. . . having only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to the ring nitrogen atom
213/63	. . . . . One oxygen atom	215/08	. . . with acylated ring nitrogen atom
213/64	. . . . . attached in position 2 or 6	215/10	. . . Quaternary compounds
213/643	. . . . . 2-Phenoxypyridines; Derivatives thereof	215/12	. . with substituted hydrocarbon radicals attached to ring carbon atoms
213/647	. . . . . and having in the molecule an acyl radical containing a saturated three-membered ring, e.g. chrysanthemumic acid esters	215/14	. . . Radicals substituted by oxygen atoms
213/65	. . . . . attached in position 3 or 5	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
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	215/18	. . . Halogen atoms or nitro radicals
213/67	. . . . . 2-Methyl-3-hydroxy-4,5-bis(hydroxy-methyl)pyridine, i.e. pyridoxine	215/20	. . . Oxygen atoms ( <a href="#">quinophthalones C09B 25/00</a> )
213/68	. . . . . attached in position 4	215/22	. . . . attached in position 2 or 4
213/69	. . . . . Two or more oxygen atoms	215/227	. . . . . only one oxygen atom which is attached in position 2
213/70	. . . . . Sulfur atoms	215/233	. . . . . only one oxygen atom which is attached in position 4
213/71	. . . . . to which a second hetero atom is attached	215/24	. . . . . attached in position 8
213/72	. . . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 213/61</a> )	215/26	. . . . . Alcohols; Ethers thereof
213/73	. . . . . Unsubstituted amino or imino radicals	215/28	. . . . . with halogen atoms or nitro radicals in positions 5, 6 or 7
213/74	. . . . . Amino or imino radicals substituted by hydrocarbon or substituted hydrocarbon radicals	215/30	. . . . . Metal salts; Chelates
213/75	. . . . . Amino or imino radicals, acylated by carboxylic or carbonic acids, or by sulfur or nitrogen analogues thereof, e.g. carbamates	215/32	. . . . . Esters
213/76	. . . . . to which a second hetero atom is attached ( <a href="#">nitro radicals C07D 213/61</a> )	215/34	. . . . . Carbamates
213/77	. . . . . Hydrazine radicals	215/36	. . . Sulfur atoms ( <a href="#">C07D 215/24 takes precedence</a> )
213/78	. . . . . Carbon atoms having three bonds to hetero atoms, with at the most one to halogen, e.g. ester or nitrile radicals	215/38	. . . Nitrogen atoms ( <a href="#">nitro radicals C07D 215/18</a> )
213/79	. . . . . Acids; Esters	215/40	. . . . . attached in position 8
213/80	. . . . . in position 3	215/42	. . . . . attached in position 4
213/803	. . . . . Processes of preparation	215/44	. . . . . with aryl radicals attached to said nitrogen atoms
213/807	. . . . . by oxidation of pyridines or condensed pyridines	215/46	. . . . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to said nitrogen atoms
213/81	. . . . . Amides; Imides	215/48	. . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
213/82	. . . . . in position 3	215/50	. . . . . attached in position 4
213/83	. . . . . Thioacids; Thioesters; Thioamides; Thioimides	215/52	. . . . . with aryl radicals attached in position 2
213/84	. . . . . Nitriles	215/54	. . . . . attached in position 3
213/85	. . . . . in position 3	215/56	. . . . . with oxygen atoms in position 4
213/86	. . . . . Hydrazides; Thio or imino analogues thereof	215/58	. with hetero atoms directly attached to the ring nitrogen atom
213/87	. . . . . in position 3	215/60	. . N-oxides
213/88	. . . . . Nicotinoylhydrazones	<b>217/00</b>	<b>Heterocyclic compounds containing isoquinoline or hydrogenated isoquinoline ring systems</b>



- 217/02 . . with only hydrogen atoms or radicals containing only carbon and hydrogen atoms, directly attached to carbon atoms of the nitrogen-containing ring; Alkylene-bis-isoquinolines
- 217/04 . . with hydrocarbon or substituted hydrocarbon radicals attached to the ring nitrogen atom
- 217/06 . . with the ring nitrogen atom acylated by carboxylic or carbonic acids, or with sulfur or nitrogen analogues thereof, e.g. carbamates
- 217/08 . . with a hetero atom directly attached to the ring nitrogen atom
- 217/10 . . Quaternary compounds
- 217/12 . . with radicals, substituted by hetero atoms, attached to carbon atoms of the nitrogen-containing ring
- 217/14 . . other than aralkyl radicals
- 217/16 . . . substituted by oxygen atoms
- 217/18 . . Aralkyl radicals
- 217/20 . . . with oxygen atoms directly attached to the aromatic ring of said aralkyl radical, e.g. papaverine
- 217/22 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the nitrogen-containing ring
- 217/24 . . Oxygen atoms
- 217/26 . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen

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

- 219/02 . . with only hydrogen, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the ring system
- 219/04 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the ring system
- 219/06 . . Oxygen atoms
- 219/08 . . Nitrogen atoms ([acridine dyes C09B 15/00](#))
- 219/10 . . . attached in position 9
- 219/12 . . . . Amino-alkyl-amino radicals attached in position 9
- 219/14 . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom
- 219/16 . . with acyl radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom

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

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

- 221/26 . . . Benzomorphans
- 221/28 . . . Morphinans

**223/00**

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

**NOTE**

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

- 223/02 . . not condensed with other rings
- 223/04 . . with only hydrogen atoms, halogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 223/06 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms ([halogen atoms C07D 223/04](#))
- 223/08 . . . Oxygen atoms
- 223/10 . . . . attached in position 2
- 223/12 . . . Nitrogen atoms not forming part of a nitro radical
- 223/14 . . condensed with carbocyclic rings or ring systems
- 223/16 . . Benzazepines; Hydrogenated benzazepines
- 223/18 . . Dibenzazepines; Hydrogenated dibenzazepines
- 223/20 . . . Dibenz [b, e] azepines; Hydrogenated dibenz [b, e] azepines
- 223/22 . . . Dibenz [b, f] azepines; Hydrogenated dibenz [b, f] azepines
- 223/24 . . . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom
- 223/26 . . . . . having a double bond between positions 10 and 11
- 223/28 . . . . . having a single bond between positions 10 and 11
- 223/30 . . . . with hetero atoms directly attached to the ring nitrogen atom
- 223/32 . . containing carbocyclic rings other than six-membered

**225/00**

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

**NOTE**

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

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

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

**NOTE**

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

- 227/02 . with only hydrogen or carbon atoms directly attached to the ring nitrogen atom
- 227/04 . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to ring carbon atoms
- 227/06 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 227/08 . . . Oxygen atoms
- 227/087 . . . . One doubly-bound oxygen atom in position 2, e.g. lactams
- 227/093 . . . . Two doubly-bound oxygen atoms attached to the carbon atoms adjacent to the ring nitrogen atom, e.g. dicarboxylic acid imides
- 227/10 . . . Nitrogen atoms not forming part of a nitro radical
- 227/12 . with hetero atoms directly attached to the ring nitrogen atom
- 229/00 Heterocyclic compounds containing rings of less than five members having two nitrogen atoms as the only ring hetero atoms**
- 229/02 . containing three-membered rings
- 231/00 Heterocyclic compounds containing 1,2-diazole or hydrogenated 1,2-diazole rings**
- 231/02 . not condensed with other rings
- 231/04 . . having no double bonds between ring members or between ring members and non-ring members
- 231/06 . . having one double bond between ring members or between ring members and non-ring members
- 231/08 . . . with oxygen or sulfur atoms directly attached to ring carbon atoms
- 231/10 . . having two or three double bonds between ring members or between ring members and non-ring members
- 231/12 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 231/14 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 231/16 . . . . Halogen atoms or nitro radicals
- 231/18 . . . . One oxygen or sulfur atom
- 231/20 . . . . . One oxygen atom attached in positions 3 or 5
- 231/22 . . . . . with aryl radicals attached to ring nitrogen atoms
- 231/24 . . . . . having sulfone or sulfonic acid radicals in the molecule
- 231/26 . . . . . 1-Phenyl-3-methyl-5- pyrazolones, unsubstituted or substituted on the phenyl ring

- 231/28 . . . . Two oxygen or sulfur atoms
- 231/30 . . . . . attached in position 3 and 5
- 231/32 . . . . . Oxygen atoms
- 231/34 . . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached in position 4
- 231/36 . . . . . with hydrocarbon radicals, substituted by hetero atoms, attached in position 4
- 231/38 . . . . Nitrogen atoms (nitro radicals C07D 231/16)
- 231/40 . . . . . Acylated on said nitrogen atom
- 231/42 . . . . . Benzene-sulfonamido pyrazoles
- 231/44 . . . . Oxygen and nitrogen or sulfur and nitrogen atoms
- 231/46 . . . . . Oxygen atom in position 3 or 5 and nitrogen atom in position 4
- 231/48 . . . . . with hydrocarbon radicals attached to said nitrogen atom
- 231/50 . . . . . Acylated on said nitrogen atom
- 231/52 . . . . . Oxygen atom in position 3 and nitrogen atom in position 5, or *vice versa*
- 231/54 . condensed with carbocyclic rings or ring-systems
- 231/56 . . Benzopyrazoles; Hydrogenated benzopyrazoles
- 233/00 Heterocyclic compounds containing 1,3-diazole or hydrogenated 1,3-diazole rings, not condensed with other rings**
- 233/02 . having no double bonds between ring members or between ring members and non-ring members
- 233/04 . having one double bond between ring members or between a ring member and a non-ring member
- 233/06 . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- 233/08 . . . with alkyl radicals, containing more than four carbon atoms, directly attached to ring carbon atoms
- 233/10 . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring nitrogen atoms
- 233/12 . . . . with substituted hydrocarbon radicals attached to ring nitrogen atoms
- 233/14 . . . . . Radicals substituted by oxygen atoms
- 233/16 . . . . . Radicals substituted by nitrogen atoms
- 233/18 . . . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one to halogen, e.g. ester or nitrile radicals
- 233/20 . . with substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 233/22 . . . Radicals substituted by oxygen atoms
- 233/24 . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
- 233/26 . . . Radicals substituted by carbon atoms having three bonds to hetero atoms
- 233/28 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 233/30 . . . Oxygen or sulfur atoms
- 233/32 . . . . One oxygen atom
- 233/34 . . . . . Ethylene-urea

- 233/36 . . . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to ring nitrogen atoms
- 233/38 . . . . with acyl radicals or hetero atoms directly attached to ring nitrogen atoms
- 233/40 . . . . Two or more oxygen atoms
- 233/42 . . . . Sulfur atoms
- 233/44 . . . Nitrogen atoms not forming part of a nitro radical
- 233/46 . . . . with only hydrogen atoms attached to said nitrogen atoms
- 233/48 . . . . with acyclic hydrocarbon or substituted acyclic hydrocarbon radicals, attached to said nitrogen atoms
- 233/50 . . . . with carbocyclic radicals directly attached to said nitrogen atoms
- 233/52 . . . . with hetero atoms directly attached to said nitrogen atoms
- 233/54 . . . having two double bonds between ring members or between ring members and non-ring members
- 233/56 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to ring carbon atoms
- 233/58 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to ring nitrogen atoms
- 233/60 . . . with hydrocarbon radicals, substituted by oxygen or sulfur atoms, attached to ring nitrogen atoms
- 233/61 . . . with hydrocarbon radicals, substituted by nitrogen atoms not forming part of a nitro radical, attached to ring nitrogen atoms
- 233/62 . . . with triarylmethyl radicals attached to ring nitrogen atoms ([triarylmethane dyes C09B 11/26](#))
- 233/64 . . with substituted hydrocarbon radicals attached to ring carbon atoms, e.g. histidine
- 233/66 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 233/68 . . . Halogen atoms
- 233/70 . . . One oxygen atom
- 233/72 . . . Two oxygen atoms, e.g. hydantoin
- 233/74 . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to other ring members
- 233/76 . . . . with substituted hydrocarbon radicals attached to the third ring carbon atom
- 233/78 . . . . Radicals substituted by oxygen atoms
- 233/80 . . . . with hetero atoms or acyl radicals directly attached to ring nitrogen atoms
- 233/82 . . . . Halogen atoms
- 233/84 . . . Sulfur atoms
- 233/86 . . . Oxygen and sulfur atoms, e.g. thiohydantoin
- 233/88 . . . Nitrogen atoms, e.g. allantoin ([nitro radicals C07D 233/91](#))
- 233/90 . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 233/91 . . . Nitro radicals
- 233/92 . . . . attached in position 4 or 5
- 233/93 . . . . with hydrocarbon radicals, substituted by halogen atoms, attached to other ring members
- 233/94 . . . . with hydrocarbon radicals, substituted by oxygen or sulfur atoms, attached to other ring members
- 233/95 . . . . with hydrocarbon radicals, substituted by nitrogen atoms, attached to other ring members
- 233/96 . . . having three double bonds between ring members or between ring members and non-ring members
- 235/00 Heterocyclic compounds containing 1,3-diazole or hydrogenated 1,3-diazole rings, condensed with other rings**
- 235/02 . . condensed with carbocyclic rings or ring systems
- 235/04 . . Benzimidazoles; Hydrogenated benzimidazoles
- 235/06 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached in position 2
- 235/08 . . . . Radicals containing only hydrogen and carbon atoms
- 235/10 . . . . Radicals substituted by halogen atoms or nitro radicals
- 235/12 . . . . Radicals substituted by oxygen atoms
- 235/14 . . . . Radicals substituted by nitrogen atoms ([by nitro radicals C07D 235/10](#))
- 235/16 . . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 235/18 . . . with aryl radicals directly attached in position 2
- 235/20 . . . Two benzimidazolyl-2 radicals linked together directly or via a hydrocarbon or substituted hydrocarbon radical
- 235/22 . . . with hetero atoms directly attached to ring nitrogen atoms ([C07D 235/10 takes precedence](#))
- 235/24 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 2
- 235/26 . . . . Oxygen atoms
- 235/28 . . . . Sulfur atoms
- 235/30 . . . . Nitrogen atoms not forming part of a nitro radical
- 235/32 . . . . Benzimidazole-2-carbamic acids, unsubstituted or substituted; Esters thereof; Thio-analogues thereof
- 237/00 Heterocyclic compounds containing 1,2-diazine or hydrogenated 1,2-diazine rings**
- 237/02 . . not condensed with other rings
- 237/04 . . having less than three double bonds between ring members or between ring members and non-ring members
- 237/06 . . having three double bonds between ring members or between ring members and non-ring members
- 237/08 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 237/10 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms



237/12	. . . . Halogen atoms or nitro radicals	239/47	. . . . . One nitrogen atom and one oxygen or sulfur atom, e.g. cytosine
237/14	. . . . Oxygen atoms	239/48	. . . . . Two nitrogen atoms
237/16	. . . . . Two oxygen atoms	239/49	. . . . . with an aralkyl radical, or substituted aralkyl radical, attached in position 5, e.g. trimethoprim
237/18	. . . . Sulfur atoms	239/50	. . . . . Three nitrogen atoms
237/20	. . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 237/12</a> )	239/52	. . . . . Two oxygen atoms
237/22	. . . . Nitrogen and oxygen atoms	239/54	. . . . . as doubly bound oxygen atoms or as unsubstituted hydroxy radicals
237/24	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	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
237/26	. condensed with carbocyclic rings or ring systems	239/553	. . . . . with halogen atoms or nitro radicals directly attached to ring carbon atoms, e.g. fluorouracil
237/28	. . Cinnolines	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
237/30	. . Phthalazines		
237/32	. . . with oxygen atoms directly attached to carbon atoms of the nitrogen-containing ring	239/56	. . . . . One oxygen atom and one sulfur atom
237/34	. . . with nitrogen atoms directly attached to carbon atoms of the nitrogen-containing ring, e.g. hydrazine radicals	239/58	. . . . . Two sulfur atoms
237/36	. . Benzo-cinnolines	239/60	. . . . . Three or more oxygen or sulfur atoms
<b>239/00</b>	<b>Heterocyclic compounds containing 1,3-diazine or hydrogenated 1,3-diazine rings</b>	239/62	. . . . . Barbituric acids
239/02	. not condensed with other rings	239/64	. . . . . Salts of organic bases; Organic double compounds
239/04	. . having no double bonds between ring members or between ring members and non-ring members	239/66	. . . . . Thiobarbituric acids
239/06	. . having one double bond between ring members or between a ring member and a non-ring member	239/68	. . . . . Salts or organic bases; Organic double compounds
239/08	. . . with heteroatoms directly attached in position 2	239/69	. . . . Benzenesulfonamido-pyrimidines
239/10	. . . . Oxygen or sulfur atoms	239/70	. condensed with carbocyclic rings or ring systems
239/12	. . . . Nitrogen atoms not forming part of a nitro radical	239/72	. . Quinazolines; Hydrogenated quinazolines
239/14	. . . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals attached to said nitrogen atoms	239/74	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to ring carbon atoms of the hetero ring
239/16	. . . . . acylated on said nitrogen atoms	239/76	. . . . N-oxides
239/18	. . . . . with hetero atoms attached to said nitrogen atoms, except nitro radicals, e.g. hydrazine radicals	239/78	. . . with hetero atoms directly attached in position 2
239/20	. . having two double bonds between ring members or between ring members and non-ring members	239/80	. . . . Oxygen atoms
239/22	. . . with hetero atoms directly attached to ring carbon atoms	239/82	. . . . . with an aryl radical attached in position 4
239/24	. . having three or more double bonds between ring members or between ring members and non-ring members	239/84	. . . . Nitrogen atoms
239/26	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	239/86	. . . with hetero atoms directly attached in position 4
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	239/88	. . . . Oxygen atoms
239/30	. . . . Halogen atoms or nitro radicals	239/90	. . . . . with acyclic radicals attached in positions 2 or 3
239/32	. . . . One oxygen, sulfur or nitrogen atom	239/91	. . . . . with aryl or aralkyl radicals attached in positions 2 or 3
239/34	. . . . . One oxygen atom	239/92	. . . . . with hetero atoms directly attached to nitrogen atoms of the hetero ring
239/36	. . . . . as doubly bound atom or as unsubstituted hydroxy radical	239/93	. . . . Sulfur atoms
239/38	. . . . . One sulfur atom	239/94	. . . . Nitrogen atoms
239/40	. . . . . as doubly bound sulfur atom or as unsubstituted mercapto radical	239/95	. . . with hetero atoms directly attached in positions 2 and 4
239/42	. . . . . One nitrogen atom ( <a href="#">nitro radicals C07D 239/30</a> ; <a href="#">benzenesulfonamido-pyrimidines C07D 239/69</a> )	239/96	. . . . Two oxygen atoms
239/46	. . . . Two or more oxygen, sulfur or nitrogen atoms ( <a href="#">benzenesulfonamido-pyrimidines C07D 239/69</a> )		

**241/00 Heterocyclic compounds containing 1,4-diazine or hydrogenated 1,4-diazine rings****NOTE**

Piperazines with only hydrogen atoms directly attached to ring carbon atoms are classified in group [C07D 295/00](#)

- 241/02 . not condensed with other rings
- 241/04 . . having no double bonds between ring members or between ring members and non-ring members
- 241/06 . . having one or two double bonds between ring members or between ring members and non-ring members
- 241/08 . . . with oxygen atoms directly attached to ring carbon atoms
- 241/10 . . having three double bonds between ring members or between ring members and non-ring members
- 241/12 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 241/14 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 241/16 . . . . Halogen atoms; Nitro radicals
- 241/18 . . . . Oxygen or sulfur atoms
- 241/20 . . . . Nitrogen atoms ([nitro radicals C07D 241/16](#))
- 241/22 . . . . Benzenesulfonamido piperazines
- 241/24 . . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 241/26 . . . . . with nitrogen atoms directly attached to ring carbon atoms
- 241/28 . . . . . in which said hetero-bound carbon atoms have double bonds to oxygen, sulfur or nitrogen atoms
- 241/30 . . . . . in which said hetero-bound carbon atoms are part of a substructure —  $C(=X)-X-C(=X)-X-$  in which X is an oxygen or sulfur atom or an imino radical, e.g. imidoylguanidines
- 241/32 . . . . . (Amino-pyrazinoyl) guanidines
- 241/34 . . . . . (Amino-pyrazine carbonamido) guanidines [2,5]
- 241/36 . condensed with carbocyclic rings or ring systems
- 241/38 . . with only hydrogen or carbon atoms directly attached to the ring nitrogen atoms
- 241/40 . . . Benzopyrazines
- 241/42 . . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the hetero ring
- 241/44 . . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the hetero ring
- 241/46 . . . Phenazines
- 241/48 . . . . with hydrocarbon radicals, substituted by nitrogen atoms, directly attached to the ring nitrogen atoms
- 241/50 . . with hetero atoms directly attached to ring nitrogen atoms
- 241/52 . . . Oxygen atoms

241/54 . . . Nitrogen atoms

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

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

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

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

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

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

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

- 249/02 . not condensed with other rings
- 249/04 . . 1,2,3-Triazoles; Hydrogenated 1,2,3-triazoles
- 249/06 . . . with aryl radicals directly attached to ring atoms
- 249/08 . . 1,2,4-Triazoles; Hydrogenated 1,2,4-triazoles
- 249/10 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms

- 249/12 . . . . Oxygen or sulfur atoms
- 249/14 . . . . Nitrogen atoms
- 249/16 . condensed with carbocyclic rings or ring systems
- 249/18 . . Benzotriazoles
- 249/20 . . . with aryl radicals directly attached in position 2
- 249/22 . . Naphthotriazoles
- 249/24 . . . with stilbene radicals attached in position 2

**251/00 Heterocyclic compounds containing 1,3,5-triazine rings**

- 251/02 . not condensed with other rings
- 251/04 . . having no double bonds between ring members or between ring members and non-ring members
- 251/06 . . . with hetero atoms directly attached to ring nitrogen atoms
- 251/08 . . having one double bond between ring members or between a ring member and a non-ring member
- 251/10 . . having two double bonds between ring members or between ring members and non-ring members
- 251/12 . . having three double bonds between ring members or between ring members and non-ring members
- 251/14 . . . with hydrogen or carbon atoms directly attached to at least one ring carbon atom
- 251/16 . . . . to only one ring carbon atom
- 251/18 . . . . with nitrogen atoms directly attached to the two other ring carbon atoms, e.g. guanamines
- 251/20 . . . . with no nitrogen atoms directly attached to a ring carbon atom
- 251/22 . . . . to two ring carbon atoms
- 251/24 . . . . to three ring carbon atoms
- 251/26 . . . with only hetero atoms directly attached to ring carbon atoms
- 251/28 . . . . Only halogen atoms, e.g. cyanuric chloride
- 251/30 . . . . Only oxygen atoms
- 251/32 . . . . . Cyanuric acid; Isocyanuric acid
- 251/34 . . . . . Cyanuric or isocyanuric esters
- 251/36 . . . . . having halogen atoms directly attached to ring nitrogen atoms
- 251/38 . . . . Sulfur atoms
- 251/40 . . . . Nitrogen atoms
- 251/42 . . . . . One nitrogen atom
- 251/44 . . . . . with halogen atoms attached to the two other ring carbon atoms
- 251/46 . . . . . with oxygen or sulfur atoms attached to the two other ring carbon atoms
- 251/48 . . . . . Two nitrogen atoms
- 251/50 . . . . . with a halogen atom attached to the third ring carbon atom
- 251/52 . . . . . with an oxygen or sulfur atom attached to the third ring carbon atom
- 251/54 . . . . . Three nitrogen atoms
- 251/56 . . . . . Preparation of melamine
- 251/58 . . . . . from cyanamide, dicyanamide or calcium cyanamide
- 251/60 . . . . . from urea or from carbon dioxide and ammonia
- 251/62 . . . . . Purification of melamine
- 251/64 . . . . . Condensation products of melamine with aldehydes; Derivatives thereof (polycondensation products [C08G](#))
- 251/66 . . . . . Derivatives of melamine in which a hetero atom is directly attached to a nitrogen atom of melamine

- 251/68 . . . . . Triazinylamino stilbenes
- 251/70 . . . . . Other substituted melamines
- 251/72 . condensed with carbocyclic rings or ring systems

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

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

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

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

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

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

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

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

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

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

261/18	. . . . Carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen	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
261/20	. condensed with carbocyclic rings or ring systems	263/60	. . Naphthoxazoles; Hydrogenated naphthoxazoles
<b>263/00</b>	<b>Heterocyclic compounds containing 1,3-oxazole or hydrogenated 1,3-oxazole rings</b>	263/62	. . having two or more ring systems containing condensed 1,3-oxazole rings
263/02	. not condensed with other rings	263/64	. . . linked in positions 2 and 2' by chains containing six-membered aromatic rings or ring systems containing such rings
263/04	. . having no double bonds between ring members or between ring members and non-ring members	<b>265/00</b>	<b>Heterocyclic compounds containing six-membered rings having one nitrogen atom and one oxygen atom as the only ring hetero atoms</b>
263/06	. . . with hydrocarbon radicals, substituted by oxygen atoms, attached to ring carbon atoms	<b>NOTE</b>	
263/08	. . having one double bond between ring members or between a ring member and a non-ring member	Morpholines having only hydrogen atoms attached to the ring carbon atoms are classified in C07D 295/00	
263/10	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	265/02	. 1,2-Oxazines; Hydrogenated 1,2-oxazines
263/12	. . . . with radicals containing only hydrogen and carbon atoms	265/04	. 1,3-Oxazines; Hydrogenated 1,3-oxazines
263/14	. . . . with radicals substituted by oxygen atoms	265/06	. . not condensed with other rings
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	265/08	. . . having one double bond between ring members or between a ring member and a non-ring member
263/18	. . . . Oxygen atoms	265/10	. . . . with oxygen atoms directly attached to ring carbon atoms
263/20	. . . . . attached in position 2	265/12	. . condensed with carbocyclic rings or ring systems
263/22	. . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to other ring carbon atoms	265/14	. . . condensed with one six-membered ring
263/24	. . . . . with hydrocarbon radicals, substituted by oxygen atoms, attached to other ring carbon atoms	265/16	. . . . with only hydrogen or carbon atoms directly attached in positions 2 and 4
263/26	. . . . . with hetero atoms or acyl radicals directly attached to the ring nitrogen atom	265/18	. . . . with hetero atoms directly attached in position 2
263/28	. . . . Nitrogen atoms not forming part of a nitro radical	265/20	. . . . with hetero atoms directly attached in position 4
263/30	. . having two or three double bonds between ring members or between ring members and non-ring members	265/22	. . . . . Oxygen atoms
263/32	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	265/24	. . . . with hetero atoms directly attached in positions 2 and 4
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	265/26	. . . . . Two oxygen atoms, e.g. isatoic anhydride
263/36	. . . . One oxygen atom	265/28	. 1,4-Oxazines; Hydrogenated 1,4-oxazines
263/38	. . . . . attached in position 2	265/30	. . not condensed with other rings
263/40	. . . . . attached in position 4	265/32	. . . with oxygen atoms directly attached to ring carbon atoms
263/42	. . . . . attached in position 5	265/33	. . . . Two oxygen atoms, in positions 3 and 5
263/44	. . . . Two oxygen atoms	265/34	. . condensed with carbocyclic rings
263/46	. . . . Sulfur atoms	265/36	. . . condensed with one six-membered ring
263/48	. . . . Nitrogen atoms not forming part of a nitro radical	265/38	. . . [b, e]-condensed with two six-membered rings
263/50	. . . . . Benzene-sulphonamido oxazoles	<b>267/00</b>	<b>Heterocyclic compounds containing rings of more than six members having one nitrogen atom and one oxygen atom as the only ring hetero atoms</b>
263/52	. condensed with carbocyclic rings or ring systems	267/02	. Seven-membered rings
263/54	. . Benzoxazoles; Hydrogenated benzoxazoles	267/04	. . having the hetero atoms in positions 1 and 2
263/56	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached in position 2	267/06	. . having the hetero atoms in positions 1 and 3
263/57	. . . . Aryl or substituted aryl radicals	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



<b>269/00</b>	<b>Heterocyclic compounds containing rings having one nitrogen atom and one oxygen atom as the only ring hetero atoms according to more than one of groups C07D 261/00 - C07D 267/00</b>	277/10	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
269/02	. having the hetero atoms in positions 1 and 3	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
<b>271/00</b>	<b>Heterocyclic compounds containing five-membered rings having two nitrogen atoms and one oxygen atom as the only ring hetero atoms</b>	277/14	. . . . Oxygen atoms
271/02	. not condensed with other rings	277/16	. . . . Sulfur atoms
271/04	. . 1,2,3-Oxadiazoles; Hydrogenated 1,2,3-oxadiazoles	277/18	. . . . Nitrogen atoms
271/06	. . 1,2,4-Oxadiazoles; Hydrogenated 1,2,4-oxadiazoles	277/20	. . having two or three double bonds between ring members or between ring members and non-ring members
271/07	. . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical	277/22	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
271/08	. . 1,2,5-Oxadiazoles; Hydrogenated 1,2,5-oxadiazoles	277/24	. . . . Radicals substituted by oxygen atoms
271/10	. . 1,3,4-Oxadiazoles; Hydrogenated 1,3,4-oxadiazoles	277/26	. . . . Radicals substituted by sulfur atoms
271/107	. . . with two aryl or substituted aryl radicals attached in positions 2 and 5	277/28	. . . . Radicals substituted by nitrogen atoms
271/113	. . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical	277/30	. . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
271/12	. condensed with carbocyclic rings or ring systems	277/32	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
<b>273/00</b>	<b>Heterocyclic compounds containing rings having nitrogen and oxygen atoms as the only ring hetero atoms, not provided for by groups C07D 261/00 - C07D 271/00</b>	277/34	. . . . Oxygen atoms
273/01	. having one nitrogen atom	277/36	. . . . Sulfur atoms
273/02	. having two nitrogen atoms and only one oxygen atom	277/38	. . . . Nitrogen atoms
273/04	. . Six-membered rings	277/40	. . . . . Unsubstituted amino or imino radicals
273/06	. . Seven-membered rings	277/42	. . . . . Amino or imino radicals substituted by hydrocarbon or substituted hydrocarbon radicals
273/08	. having two nitrogen atoms and more than one oxygen atom	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
<b>Heterocyclic compounds having nitrogen and sulfur as the only ring hetero atoms</b>		277/50	. . . . . Nitrogen atoms bound to hetero atoms (nitro radicals C07D 277/58)
<b>275/00</b>	<b>Heterocyclic compounds containing 1,2-thiazole or hydrogenated 1,2-thiazole rings</b>	277/52	. . . . . to sulfur atoms, e.g. sulfonamides
275/02	. not condensed with other rings	277/54	. . . . Nitrogen and either oxygen or sulfur atoms
275/03	. . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms	277/56	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
275/04	. condensed with carbocyclic rings or ring systems	277/58	. . . . Nitro radicals
275/06	. . with hetero atoms directly attached to the ring sulfur atom	277/587	. . . with aliphatic hydrocarbon radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms, said aliphatic radicals being substituted in the alpha-position to the ring by a hetero atom, e.g.
<b>277/00</b>	<b>Heterocyclic compounds containing 1,3-thiazole or hydrogenated 1,3-thiazole rings</b>		$\begin{array}{c} \text{---N} \\   \\ \text{+---S---} \text{C---}(\text{CH}_2)_m\text{---C}\equiv \\    \\ \text{Z} \end{array}$ with m >= 0, Z being a singly or a doubly bound hetero atom
277/02	. not condensed with other rings	277/593	. . . . Z being doubly bound oxygen or doubly bound nitrogen, which nitrogen is part of a possibly substituted oximino radical
277/04	. . having no double bonds between ring members or between ring members and non-ring members	277/60	. condensed with carbocyclic rings or ring-systems
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	277/62	. . Benzothiazoles
277/08	. . having one double bond between ring members or between a ring member and a non-ring member		



277/64	. . . with only hydrocarbon or substituted hydrocarbon radicals attached in position 2	281/12	. . . . condensed with two six-membered rings
277/66	. . . . with aromatic rings or ring systems directly attached in position 2	281/14	. . . . [b, e]-condensed
277/68	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 2	281/16	. . . . [b, f]-condensed
		281/18	. Eight-membered rings
277/70	. . . . Sulfur atoms	<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>
277/72	. . . . 2-Mercaptobenzothiazole	283/02	. having the hetero atoms in positions 1 and 3
277/74	. . . . Sulfur atoms substituted by carbon atoms	<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>
277/76	. . . . Sulfur atoms attached to a second hetero atom		
277/78	. . . . to a sulfur atom	285/01	. Five-membered rings
277/80	. . . . to a nitrogen atom	285/02	. . Thiadiazoles; Hydrogenated thiadiazoles
277/82	. . . . Nitrogen atoms	285/04	. . . not condensed with other rings
277/84	. . Naphthothiazoles	285/06	. . . . 1,2,3-Thiadiazoles; Hydrogenated 1,2,3-thiadiazoles
<b>279/00</b>	<b>Heterocyclic compounds containing six-membered rings having one nitrogen atom and one sulfur atom as the only ring hetero atoms</b>	285/08	. . . . 1,2,4-Thiadiazoles; Hydrogenated 1,2,4-thiadiazoles
	<b>NOTE</b>	285/10	. . . . 1,2,5-Thiadiazoles; Hydrogenated 1,2,5-thiadiazoles
	Thiomorpholines having only hydrogen atoms attached to the ring carbon atoms are classified in <a href="#">C07D 295/00</a>	285/12	. . . . 1,3,4-Thiadiazoles; Hydrogenated 1,3,4-thiadiazoles
279/02	. 1,2-Thiazines; Hydrogenated 1,2-thiazines	285/125	. . . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical
279/04	. 1,3-Thiazines; Hydrogenated 1,3-thiazines	285/13	. . . . . Oxygen atoms
279/06	. . not condensed with other rings	285/135	. . . . . Nitrogen atoms
279/08	. . condensed with carbocyclic rings or ring systems	285/14	. . . condensed with carbocyclic rings or ring systems
279/10	. 1,4-Thiazines; Hydrogenated 1,4-thiazines	285/15	. Six-membered rings
279/12	. . not condensed with other rings	285/16	. . Thiadiazines; Hydrogenated thiadiazines
279/14	. . condensed with carbocyclic rings or ring systems	285/18	. . . 1,2,4-Thiadiazines; Hydrogenated 1,2,4-thiadiazines
279/16	. . . condensed with one six-membered ring	285/20	. . . . condensed with carbocyclic rings or ring systems
279/18	. . . [b, e]-condensed with two six-membered rings	285/22	. . . . condensed with one six-membered ring
279/20	. . . . with hydrogen atoms directly attached to the ring nitrogen atom	285/24	. . . . with oxygen atoms directly attached to the ring sulfur atom
279/22	. . . . with carbon atoms directly attached to the ring nitrogen atom	285/26	. . . . . substituted in position 6 or 7 by sulfamoyl or substituted sulfamoyl radicals
279/24	. . . . with hydrocarbon radicals, substituted by amino 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
279/26	. . . . . without other substituents attached to the ring system	285/30	. . . . . with hydrocarbon radicals, substituted by hetero atoms attached in position 3
279/28	. . . . . with other substituents attached to the ring system	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
279/30	. . . . with acyl radicals attached to the ring nitrogen atom		
279/32	. . . . with hetero atoms directly attached to the ring nitrogen atom	285/34	. . . 1,3,5-Thiadiazines; Hydrogenated 1,3,5-thiadiazines
279/34	. . . . with hetero atoms directly attached to the ring sulfur atom	285/36	. Seven-membered rings
279/36	. . . [b, e]-condensed, at least one with a further condensed benzene ring	285/38	. Eight-membered rings
<b>281/00</b>	<b>Heterocyclic compounds containing rings of more than six members having one nitrogen atom and one sulfur atom as the only ring hetero atoms</b>		
281/02	. Seven-membered rings		
281/04	. . having the hetero atoms in positions 1 and 4		
281/06	. . . not condensed with other rings		
281/08	. . . condensed with carbocyclic rings or ring systems		
281/10	. . . . condensed with one six-membered ring		

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

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

**293/00 Heterocyclic compounds containing rings having nitrogen and selenium or nitrogen and tellurium, with or without oxygen or sulfur atoms, as the ring hetero atoms**

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

**295/00 Heterocyclic compounds containing polymethylene-imine rings with at least five ring members, 3-azabicyclo [3.2.2.] nonane, piperazine, morpholine or thiomorpholine rings, having only hydrogen atoms directly attached to the ring carbon atoms**

- 295/02 . containing only hydrogen and carbon atoms in addition to the ring hetero elements
- 295/023 . . Preparation; Separation; Stabilisation; Use of additives
- 295/027 . . containing only one hetero ring
- 295/03 . . . with the ring nitrogen atoms directly attached to acyclic carbon atoms
- 295/033 . . . with the ring nitrogen atoms directly attached to carbocyclic rings
- 295/037 . . with quaternary ring nitrogen atoms
- 295/04 . with substituted hydrocarbon radicals attached to ring nitrogen atoms
- 295/06 . . substituted by halogen atoms or nitro radicals
- 295/067 . . . with the ring nitrogen atoms and the substituents attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/073 . . . with the ring nitrogen atoms and the substituents separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/08 . . substituted by singly bound oxygen or sulfur atoms
- 295/084 . . . with the ring nitrogen atoms and the oxygen or sulfur atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/088 . . . . to an acyclic saturated chain
- 295/092 . . . . with aromatic radicals attached to the chain
- 295/096 . . . with the ring nitrogen atoms and the oxygen or sulfur atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/10 . . substituted by doubly bound oxygen or sulfur atoms ([acylated ring nitrogen atoms C07D 295/16](#))
- 295/104 . . . with the ring nitrogen atoms and the doubly bound oxygen or sulfur atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/108 . . . . to an acyclic saturated chain

- 295/112 . . . with the ring nitrogen atoms and the doubly bound oxygen or sulfur atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/116 . . . . with the doubly bound oxygen or sulfur atoms directly attached to a carbocyclic ring
- 295/12 . . substituted by singly or doubly bound nitrogen atoms ([nitro radicals C07D 295/06](#))
- 295/125 . . . with the ring nitrogen atoms and the substituent nitrogen atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/13 . . . . to an acyclic saturated chain
- 295/135 . . . with the ring nitrogen atoms and the substituent nitrogen atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/14 . . substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 295/145 . . . with the ring nitrogen atoms and the carbon atoms with three bonds to hetero atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/15 . . . . to an acyclic saturated chain
- 295/155 . . . with the ring nitrogen atoms and the carbon atoms with three bonds to hetero atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/16 . acylated on ring nitrogen atoms
- 295/18 . . by radicals derived from carboxylic acids, or sulfur or nitrogen analogues thereof
- 295/182 . . . Radicals derived from carboxylic acids
- 295/185 . . . . from aliphatic carboxylic acids
- 295/192 . . . . from aromatic carboxylic acids
- 295/194 . . . Radicals derived from thio- or thiono carboxylic acids
- 295/195 . . . Radicals derived from nitrogen analogues of carboxylic acids
- 295/20 . . by radicals derived from carbonic acid, or sulfur or nitrogen analogues thereof
- 295/205 . . . Radicals derived from carbonic acid
- 295/21 . . . Radicals derived from sulfur analogues of carbonic acid
- 295/215 . . . Radicals derived from nitrogen analogues of carbonic acid
- 295/22 . with hetero atoms directly attached to ring nitrogen atoms
- 295/24 . . Oxygen atoms
- 295/26 . . Sulfur atoms
- 295/28 . . Nitrogen atoms
- 295/30 . . . non-acylated
- 295/32 . . . acylated with carboxylic or carbonic acids, or their nitrogen or sulfur analogues

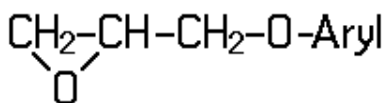
**Heterocyclic compounds having oxygen atoms with or without sulfur, selenium or tellurium, as ring hetero atoms****301/00 Preparation of oxiranes**

- 301/02 . Synthesis of the oxirane ring
- 301/03 . . by oxidation of unsaturated compounds, or of mixtures of unsaturated and saturated compounds
- 301/04 . . . with air or molecular oxygen
- 301/06 . . . . in the liquid phase

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

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

- 303/02 . Compounds containing oxirane rings
- 303/04 . . containing only hydrogen and carbon atoms in addition to the ring oxygen atoms
- 303/06 . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings
- 303/08 . . with hydrocarbon radicals, substituted by halogen atoms, nitro radicals or nitroso radicals
- 303/10 . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings (steroids C07J)
- 303/12 . . with hydrocarbon radicals substituted by singly or doubly bound oxygen atoms
- 303/14 . . . by free hydroxyl radicals
- 303/16 . . . by esterified hydroxyl radicals
- 303/17 . . . . containing oxirane rings condensed with carbocyclic ring systems having three or more relevant rings
- 303/18 . . . by etherified hydroxyl radicals
- 303/20 . . . . Ethers with hydroxy compounds containing no oxirane rings
- 303/22 . . . . . with monohydroxy compounds
- 303/23 . . . . . Oxiranylmethyl ethers of compounds having one hydroxy group bound to a six-membered aromatic ring, the oxiranylmethyl radical not being further substituted, i.e.



- 303/24 . . . . . with polyhydroxy compounds
- 303/26 . . . . . having one or more free hydroxyl radicals
- 303/27 . . . . . having all hydroxyl radicals etherified with oxirane containing compounds

- 303/28 . . . . Ethers with hydroxy compounds containing oxirane rings
- 303/30 . . . . . Ethers of oxirane-containing polyhydroxy compounds in which all hydroxyl radicals are etherified with oxirane-containing hydroxy compounds
- 303/31 . . . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings
- 303/32 . . . by aldehyde- or ketonic radicals
- 303/34 . . with hydrocarbon radicals substituted by sulfur, selenium or tellurium atoms
- 303/36 . . with hydrocarbon radicals substituted by nitrogen atoms (nitro, nitroso radicals C07D 303/08)
- 303/38 . . with hydrocarbon radicals substituted by carbon atoms having three bonds to heteroatoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 303/40 . . . by ester radicals
- 303/42 . . . . Acyclic compounds having a chain of seven or more carbon atoms, e.g. epoxidised fats
- 303/44 . . . . Esterified with oxirane-containing hydroxy compounds
- 303/46 . . . by amide or nitrile radicals
- 303/48 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms; with at the most one bond to halogen, directly attached to ring carbon atoms, e.g. ester or nitrile radicals

**305/00 Heterocyclic compounds containing four-membered rings having one oxygen 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	307/71	. . . . . attached in position 5
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	307/72	. . . . . with hydrocarbon radicals, substituted by nitrogen-containing radicals, attached in position 2
307/20	. . . . Oxygen atoms	307/73	. . . . . by amino or imino, or substituted amino or imino radicals
307/22	. . . . Nitrogen atoms not forming part of a nitro radical	307/74	. . . . . by hydrazino or hydrazono or such substituted radicals
307/24	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	307/75	. . . . . having carboxylic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. hydrazides
307/26	. . having one double bond between ring members or between a ring member and a non-ring member	307/76	. . . . . having carbonic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. semicarbazides
307/28	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms	307/77	. ortho- or peri-condensed with carbocyclic rings or ring systems
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	307/78	. . Benzo [b] furans; Hydrogenated benzo [b] furans
307/32	. . . . Oxygen atoms	307/79	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals directly attached to carbon atoms of the hetero ring
307/33	. . . . . in position 2, the oxygen atom being in its keto or unsubstituted enol form	307/80	. . . . Radicals substituted by oxygen atoms
307/34	. . having two or three double bonds between ring members or between ring members and non-ring members	307/81	. . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
307/36	. . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms	307/82	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the hetero ring
307/38	. . . with substituted hydrocarbon radicals attached to ring carbon atoms	307/83	. . . . Oxygen atoms
307/40	. . . . Radicals substituted by oxygen atoms	307/84	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
307/42	. . . . . Singly bound oxygen atoms ( <a href="#">two oxygen atoms bound to the same carbon atom C07D 307/46</a> )	307/85	. . . . . attached in position 2
307/44	. . . . . Furfuryl alcohol	307/86	. . . with an oxygen atom directly attached in position 7
307/45	. . . . . Oxygen atoms acylated by a cyclopropane containing carboxylic acyl radical, e.g. chrysanthemumates	307/87	. . Benzo [c] furans; Hydrogenated benzo [c] furans
307/46	. . . . . Doubly bound oxygen atoms, or two oxygen atoms singly bound to the same carbon atom	307/88	. . . with one oxygen atom directly attached in position 1 or 3
307/48	. . . . . Furfural	307/885	. . . . 3,3-Diphenylphthalides
307/50	. . . . . Preparation from natural products	307/89	. . . with two oxygen atoms directly attached in positions 1 and 3
307/52	. . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical	307/90	. . . with an oxygen atom in position 1 and a nitrogen atom in position 3, or <u>vice versa</u>
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	307/91	. . Dibenzofurans; Hydrogenated dibenzofurans
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	307/92	. . Naphthofurans; Hydrogenated naphthofurans
307/58	. . . . One oxygen atom, e.g. butenolide	307/93	. . condensed with a ring other than six-membered
307/60	. . . . Two oxygen atoms, e.g. succinic anhydride	307/935	. . . Not further condensed cyclopenta [b] furans or hydrogenated cyclopenta [b] furans
307/62	. . . . Three oxygen atoms, e.g. ascorbic acid	307/937	. . . . with hydrocarbon or substituted hydrocarbon radicals directly attached in position 2, e.g. prostacyclins
307/64	. . . . Sulfur atoms	307/94	. spiro-condensed with carbocyclic rings or ring systems, e.g. griseofulvins
307/66	. . . . Nitrogen atoms ( <a href="#">nitro radicals C07D 307/70</a> )	<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>
307/68	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen	309/02	. having no double bonds between ring members or between ring members and non-ring members
307/70	. . . . Nitro radicals	309/04	. . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
		309/06	. . . Radicals substituted by oxygen atoms



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



311/96	• spiro-condensed with carbocyclic rings or ring systems	317/48	• • • • Methyleneedioxybenzenes or hydrogenated methylenedioxybenzenes unsubstituted on the hetero ring
<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>	317/50	• • • • • with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to atoms of the carbocyclic ring
313/02	• Seven-membered rings	317/52	• • • • • Radicals substituted by halogen atoms or nitro radicals
313/04	• • not condensed with other rings	317/54	• • • • • Radicals substituted by oxygen atoms
313/06	• • condensed with carbocyclic rings or ring systems	317/56	• • • • • Radicals substituted by sulfur atoms
313/08	• • • condensed with one six-membered ring	317/58	• • • • • Radicals substituted by nitrogen atoms (by nitro radicals <a href="#">C07D 317/52</a> )
313/10	• • • condensed with two six-membered rings	317/60	• • • • • Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
313/12	• • • • [b,e]-condensed	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
313/14	• • • • [b,f]-condensed	317/64	• • • • • Oxygen atoms
313/16	• Eight-membered rings	317/66	• • • • • Nitrogen atoms not forming part of a nitro radical
313/18	• • not condensed with other rings	317/68	• • • • • Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
313/20	• • condensed with carbocyclic rings or ring systems	317/70	• • • condensed with ring systems containing two or more relevant rings
<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>	317/72	• • spiro-condensed with carbocyclic rings
<b>317/00</b>	<b>Heterocyclic compounds containing five-membered rings having two oxygen 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>
317/02	• having the hetero atoms in positions 1 and 2	319/02	• 1,2-Dioxanes; Hydrogenated 1,2-dioxanes
317/04	• • not condensed with other rings	319/04	• 1,3-Dioxanes; Hydrogenated 1,3-dioxanes
317/06	• • condensed with carbocyclic rings or ring systems	319/06	• • not condensed with other rings
317/08	• having the hetero atoms in positions 1 and 3	319/08	• • condensed with carbocyclic rings or ring systems
317/10	• • not condensed with other rings	319/10	• 1,4-Dioxanes; Hydrogenated 1,4-dioxanes
317/12	• • • with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms	319/12	• • not condensed with other rings
317/14	• • • with substituted hydrocarbon radicals attached to ring carbon atoms	319/14	• • condensed with carbocyclic rings or ring systems
317/16	• • • • Radicals substituted by halogen atoms or nitro radicals	319/16	• • • condensed with one six-membered ring
317/18	• • • • Radicals substituted by singly bound oxygen or sulfur atoms	319/18	• • • • Ethylenedioxybenzenes, not substituted on the hetero ring
317/20	• • • • • Free hydroxyl or mercaptan	319/20	• • • • with substituents attached to the hetero ring
317/22	• • • • • etherified	319/22	• • • condensed with one naphthalene or hydrogenated naphthalene ring system
317/24	• • • • • esterified	319/24	• • • [b,e]-condensed with two six-membered rings
317/26	• • • • Radicals substituted by doubly bound oxygen or sulfur atoms or by two such atoms singly bound to the same carbon atom	<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>
317/28	• • • • Radicals substituted by nitrogen atoms (by nitro radicals <a href="#">C07D 317/16</a> )	321/02	• Seven-membered rings
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	321/04	• • not condensed with other rings
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	321/06	• • • 1,3-Dioxepines; Hydrogenated 1,3-dioxepines
317/34	• • • • Oxygen atoms	321/08	• • • 1,4-Dioxepines; Hydrogenated 1,4-dioxepines
317/36	• • • • • Alkylene carbonates; Substituted alkylene carbonates	321/10	• • condensed with carbocyclic rings or ring systems
317/38	• • • • • Ethylene carbonate	321/12	• Eight-membered rings
317/40	• • • • • Vinylene carbonate; Substituted vinylene carbonates	<b>323/00</b>	<b>Heterocyclic compounds containing more than two oxygen atoms as the only ring hetero atoms</b>
317/42	• • • • Halogen atoms or nitro radicals	323/02	• Five-membered rings
317/44	• • ortho- or peri-condensed with carbocyclic rings or ring systems	323/04	• Six-membered rings
317/46	• • • condensed with one six-membered ring		

323/06	. . Trioxane	333/36	. . . . Nitrogen atoms ( <a href="#">nitro, nitroso radicals C07D 333/42</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>	333/38	. . . . Carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals
<b>327/00</b>	<b>Heterocyclic compounds containing rings having oxygen and sulfur atoms as the only ring hetero atoms</b>	333/40	. . . . Thiophene-2-carboxylic acid [2]
327/02	. one oxygen atom and one sulfur atom	333/42	. . . . with nitro or nitroso radicals directly attached to ring carbon atoms
327/04	. . Five-membered rings	333/44	. . . . attached in position 5
327/06	. . Six-membered rings	333/46	. . substituted on the ring sulfur atom
327/08	. . . [b,e]-condensed with two six-membered carbocyclic rings	333/48	. . . by oxygen atoms
327/10	. two oxygen atoms and one sulfur atom, e.g. cyclic sulfates	333/50	. condensed with carbocyclic rings or ring systems
<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>	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
<b><u>Heterocyclic compounds having sulfur, selenium or tellurium as the only ring hetero atoms</u></b>			
<b>331/00</b>	<b>Heterocyclic compounds containing rings of less than five members, having one sulfur atom as the only ring hetero atom</b>	333/62	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the hetero ring
331/02	. Three-membered rings	333/64	. . . . Oxygen atoms
331/04	. Four-membered rings	333/66	. . . . Nitrogen atoms not forming part of a nitro radical
<b>333/00</b>	<b>Heterocyclic compounds containing five-membered rings having one sulfur atom as the only ring hetero atom</b>	333/68	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
333/02	. not condensed with other rings	333/70	. . . . attached in position 2
333/04	. . not substituted on the ring sulfur	333/72	. . Benzo[c]thiophenes; Hydrogenated benzo[c]thiophenes
333/06	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring carbon atoms	333/74	. . Naphthothiophenes
333/08	. . . . Hydrogen atoms or radicals containing only hydrogen and carbon atoms	333/76	. . Dibenzothiophenes
333/10	. . . . Thiophene	333/78	. . condensed with rings other than six-membered or with ring systems containing such rings
333/12	. . . . Radicals substituted by halogen atoms or nitro or nitroso radicals	333/80	. . . Seven-membered rings
333/14	. . . . Radicals substituted by singly bound hetero atoms other than halogen	<b>335/00</b>	<b>Heterocyclic compounds containing six-membered rings having one sulfur atom as the only ring hetero atom</b>
333/16	. . . . by oxygen atoms	335/02	. not condensed with other rings
333/18	. . . . by sulfur atoms	335/04	. condensed with carbocyclic rings or ring systems
333/20	. . . . by nitrogen atoms ( <a href="#">nitro, nitroso radicals C07D 333/12</a> )	335/06	. . Benzothiopyrans; Hydrogenated benzothiopyrans
333/22	. . . . Radicals substituted by doubly bound hetero atoms, or by two hetero atoms other than halogen singly bound to the same carbon atom	335/08	. . Naphthothiopyrans; Hydrogenated naphthothiopyrans
333/24	. . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals	335/10	. . Dibenzothiopyrans; Hydrogenated dibenzothiopyrans
333/26	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms	335/12	. . . Thioxanthenes
333/28	. . . . Halogen atoms	335/14	. . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 9
333/30	. . . . Hetero atoms other than halogen	335/16	. . . . Oxygen atoms, e.g. thioxanthenes
333/32	. . . . Oxygen atoms	335/18	. . . . Nitrogen atoms
333/34	. . . . Sulfur atoms	335/20	. . . . with hydrocarbon radicals, substituted by amino radicals, directly attached in position 9
		<b>337/00</b>	<b>Heterocyclic compounds containing rings of more than six members having one sulfur atom as the only ring hetero atom</b>

337/02	. Seven-membered rings	403/14	. containing three or more hetero rings
337/04	. . not condensed with other rings	<b>405/00</b>	<b>Heterocyclic compounds containing both one or more hetero rings having oxygen atoms as the only ring hetero atoms, and one or more rings having nitrogen as the only ring hetero atom</b>
337/06	. . condensed with carbocyclic rings or ring systems	405/02	. containing two hetero rings
337/08	. . . condensed with one six-membered ring	405/04	. . directly linked by a ring-member-to-ring-member bond
337/10	. . . condensed with two six-membered rings	405/06	. . linked by a carbon chain containing only aliphatic carbon atoms
337/12	. . . . [b,e]-condensed	405/08	. . linked by a carbon chain containing alicyclic rings
337/14	. . . . [b,f]-condensed	405/10	. . linked by a carbon chain containing aromatic rings
337/16	. Eight-membered rings	405/12	. . linked by a chain containing hetero atoms as chain links
<b>339/00</b>	<b>Heterocyclic compounds containing rings having two sulfur atoms as the only ring hetero atoms</b>	405/14	. containing three or more hetero rings
339/02	. Five-membered rings	<b>407/00</b>	<b>Heterocyclic compounds containing two or more hetero rings, at least one ring having oxygen atoms as the only ring hetero atoms, not provided for by group C07D 405/00</b>
339/04	. . having the hetero atoms in position 1,2, e.g. lipoic acid	407/02	. containing two hetero rings
339/06	. . having the hetero atoms in position 1,3, e.g. cyclic dithiocarbonates	407/04	. . directly linked by a ring-member-to-ring-member bond
339/08	. Six-membered rings	407/06	. . linked by a carbon chain containing only aliphatic carbon atoms
<b>341/00</b>	<b>Heterocyclic compounds containing rings having three or more sulfur atoms as the only ring hetero atoms</b>	407/08	. . linked by a carbon chain containing alicyclic rings
<b>343/00</b>	<b>Heterocyclic compounds containing rings having sulfur and selenium or sulfur and tellurium atoms as the only ring hetero atoms</b>	407/10	. . linked by a carbon chain containing aromatic rings
<b>345/00</b>	<b>Heterocyclic compounds containing rings having selenium or tellurium atoms as the only ring hetero atoms</b>	407/12	. . linked by a chain containing hetero atoms as chain links
<b>347/00</b>	<b>Heterocyclic compounds containing rings having halogen atoms as ring hetero atoms</b>	407/14	. containing three or more hetero rings
<b>Heterocyclic compounds containing two or more hetero rings</b>		<b>409/00</b>	<b>Heterocyclic compounds containing two or more hetero rings, at least one ring having sulfur atoms as the only ring hetero atoms</b>
<b>401/00</b>	<b>Heterocyclic compounds containing two or more hetero rings, having nitrogen atoms as the only ring hetero atoms, at least one ring being a six-membered ring with only one nitrogen atom</b>	409/02	. containing two hetero rings
401/02	. containing two hetero rings	409/04	. . directly linked by a ring-member-to-ring-member bond
401/04	. . directly linked by a ring-member-to-ring-member bond	409/06	. . linked by a carbon chain containing only aliphatic carbon atoms
401/06	. . linked by a carbon chain containing only aliphatic carbon atoms	409/08	. . linked by a carbon chain containing alicyclic rings
401/08	. . linked by a carbon chain containing alicyclic rings	409/10	. . linked by a carbon chain containing aromatic rings
401/10	. . linked by a carbon chain containing aromatic rings	409/12	. . linked by a chain containing hetero atoms as chain links
401/12	. . linked by a chain containing hetero atoms as chain links	409/14	. containing three or more hetero rings
401/14	. containing three or more hetero rings	<b>411/00</b>	<b>Heterocyclic compounds containing two or more hetero rings, at least one ring having oxygen and sulfur atoms as the only ring hetero atoms</b>
<b>403/00</b>	<b>Heterocyclic compounds containing two or more hetero rings, having nitrogen atoms as the only ring hetero atoms, not provided for by group C07D 401/00</b>	411/02	. containing two hetero rings
403/02	. containing two hetero rings	411/04	. . directly linked by a ring-member-to-ring-member bond
403/04	. . directly linked by a ring-member-to-ring-member bond	411/06	. . linked by a carbon chain containing only aliphatic carbon atoms
403/06	. . linked by a carbon chain containing only aliphatic carbon atoms	411/08	. . linked by a carbon chain containing alicyclic rings
403/08	. . linked by a carbon chain containing alicyclic rings	411/10	. . linked by a carbon chain containing aromatic rings
403/10	. . linked by a carbon chain containing aromatic rings	411/12	. . linked by a chain containing hetero atoms as chain links
403/12	. . 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 quinoly1-4, a substituted quinoly1-4 or a alkylendioxy-quinoly1-4 radical linked through only one carbon atom, attached in position 2, e.g. quinine
- 453/06 . containing isoquinuclidine ring systems



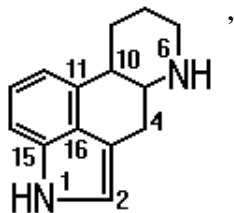
- 455/00** Heterocyclic compounds containing quinolizine ring systems, e.g. emetine alkaloids, protoberberine; Alkylenedioxy derivatives of dibenzo [a, g] quinolizines, e.g. berberine
- 455/02 . containing not further condensed quinolizine ring systems
- 455/03 . containing quinolizine ring systems directly condensed with at least one six-membered carbocyclic ring, e.g. protoberberine; Alkylenedioxy derivatives of dibenzo [a, g] quinolizines, e.g. berberine

**WARNING**

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

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

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



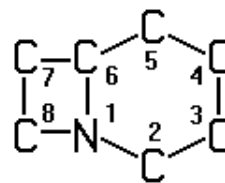
e.g. lysergic acid (compounds of the cyclic peptide type derived from ergotamine [C07D 519/02](#))

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

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

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

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



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

**WARNING**

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

- 463/02 . Preparation (by microbiological processes [C12P 17/18](#))
- 463/04 . . by forming the ring or condensed ring systems
- 463/06 . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 463/08 . . . Modification of a carboxyl group directly attached in position 2, e.g. esterification
- 463/10 . with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 463/12 . . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals attached in position 7
- 463/14 . . with hetero atoms directly attached in position 7
- 463/16 . . . Nitrogen atoms
- 463/18 . . . . further acylated by radicals derived from carboxylic acids or by nitrogen or sulfur analogues thereof
- 463/20 . . . . . with the acylating radicals further substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 463/22 . . . . . further substituted by nitrogen atoms

- 471/00** Heterocyclic compounds containing nitrogen atoms as the only ring hetero atoms in the condensed system, at least one ring being a six-membered ring with one nitrogen atom, not provided for by groups [C07D 451/00](#) - [C07D 463/00](#)
- 471/02 . in which the condensed system contains two hetero rings
- 471/04 . . Ortho-condensed systems (carbacephalosporins [C07D 463/00](#))
- 471/06 . . Peri-condensed systems
- 471/08 . . Bridged systems
- 471/10 . . Spiro-condensed systems
- 471/12 . in which the condensed system contains three hetero rings
- 471/14 . . Ortho-condensed systems
- 471/16 . . Peri-condensed systems
- 471/18 . . Bridged systems
- 471/20 . . Spiro-condensed systems



- 471/22 . . in which the condensed systems contains four or more hetero rings

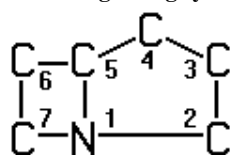
**473/00 Heterocyclic compounds containing purine ring systems**

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

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

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

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



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

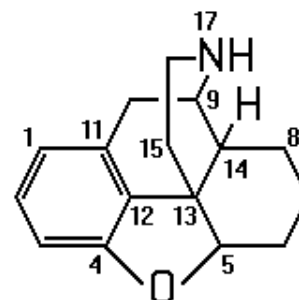
- 477/02 . . Preparation (by microbiological processes [C12P 17/18](#))
- 477/04 . . by forming the ring or condensed ring systems

- 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

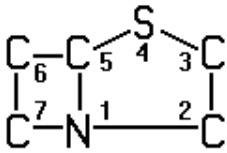
**487/00 Heterocyclic compounds containing nitrogen atoms as the only ring hetero atoms in the condensed system, not provided for by [C07D 451/00](#) - [C07D 477/00](#)**

- 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:**

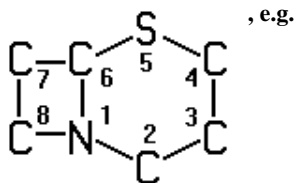


- 489/02 . with oxygen atoms attached in positions 3 and 6, e.g. morphine, morphinone
- 489/04 . . Salts; Organic complexes
- 489/06 . with a hetero atom directly attached in position 14
- 489/08 . . Oxygen atom
- 489/09 . containing 4aH-8, 9 c-Iminoethano- phenanthro [4, 5-b, c, d] furan ring systems 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:**
- 
- , e.g. penicillins,**
- penems; Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring**
- 499/04 . Preparation
- 499/06 . . by forming the ring or condensed ring systems  
(by microbiological processes [C12P 37/00](#))
- 499/08 . . Modification of a carboxyl radical directly attached in position 2, e.g. esterification
- 499/10 . . Modification of an amino radical directly attached in position 6
- 499/12 . . . Acylation
- 499/14 . . Preparation of salts
- 499/16 . . . of alkali or alkaline earth metals
- 499/18 . . Separation; Purification
- 499/20 . . . via salts with organic bases
- 499/21 . with a nitrogen atom directly attached in position 6 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/22 . . Salts with organic bases; Complexes with organic compounds
- 499/24 . . . with acyclic or carbocyclic compounds containing amino radicals
- 499/26 . . . with heterocyclic compounds
- 499/28 . . with modified 2-carboxyl group
- 499/30 . . . Acid anhydride
- 499/32 . . . Esters
- 499/34 . . . Thio-acid; Esters thereof
- 499/36 . . . . O-esters
- 499/38 . . . . S-esters
- 499/40 . . . Amides; Hydrazides; Azides
- 499/42 . . Compounds with a free primary amino radical attached in position 6
- 499/44 . . Compounds with an amino radical acylated by carboxylic acids, attached in position 6
- 499/46 . . . with acyclic hydrocarbon radicals or such radicals substituted by carbocyclic or heterocyclic rings, attached to the carboxamido radical
- 499/48 . . . with a carbon chain, substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, attached to the carboxamido radical
- 499/50 . . . . substituted in beta-position to the carboxamido radical
- 499/52 . . . . . by oxygen or sulfur atoms
- 499/54 . . . . . by nitrogen atoms
- 499/56 . . . . . by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen

- 499/58 . . . . substituted in alpha-position to the carboxamido radical
- 499/60 . . . . . by oxygen atoms
- 499/62 . . . . . by sulfur atoms
- 499/64 . . . . . by nitrogen atoms
- 499/66 . . . . . with alicyclic rings as additional substituents on the carbon chain
- 499/68 . . . . . with aromatic rings as additional substituents on the carbon chain
- 499/70 . . . . . with hetero rings as additional substituents on the carbon chain
- 499/72 . . . . . by carbon atoms having three bonds to hetero atoms
- 499/74 . . . with carbocyclic rings directly attached to the carboxamido radical
- 499/76 . . . with hetero rings directly attached to the carboxamido radical
- 499/78 . . Compounds with an amino radical, acylated by carbonic acid, or by nitrogen or sulfur analogues thereof, attached in position 6
- 499/80 . . Compounds with a nitrogen-containing hetero ring, attached with the ring nitrogen atom in position 6
- 499/86 . with only atoms other than nitrogen atoms directly attached in position 6 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 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:**

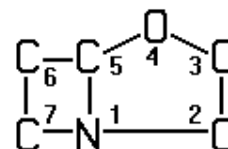


**cephalosporins; Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring**

- 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 aliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
- 501/46 . . . . . with the 7-amino radical acylated by carboxylic acids containing hetero rings
- 501/48 . . . . Methylene radicals, substituted by hetero rings (C07D 501/38 - C07D 501/46 take precedence)
- 501/50 . . . . . with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
- 501/52 . . . . . with the 7-amino radical acylated by an 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

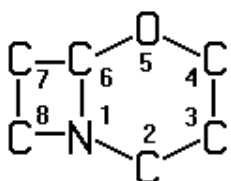
**503/00 Heterocyclic compounds containing 4-oxa-1-azabicyclo [3.2.0] heptane ring systems, i.e. compounds containing a ring system of the formula:**



**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. vincalcalcin



- 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](#)