CPC  COOPERATIVE PATENT CLASSIFICATION

C  CHEMISTRY; METALLURGY
  (NOTES omitted)

CHEMISTRY

C07  ORGANIC CHEMISTRY
  (NOTES omitted)

C07F  ACYCLIC, CARBOCYCLIC OR HETEROCYCLIC COMPOUNDS CONTAINING ELEMENTS OTHER THAN CARBON, HYDROGEN, HALOGEN, OXYGEN, NITROGEN, SULFUR, SELENIUM OR TELLURIUM (metal-containing porphyrins C07D 487/22)

NOTES
1. Attention is drawn to Note (3) C07, which defines the last place priority rule applied in the range of subclasses C07C-C07K and within these subclasses.
2. Attention is drawn to Note (6) following the title of class C07.
3. Attention is drawn to Note (3) after the title of section C, which Note indicates to which version of the periodic table of chemical elements the IPC refers.
4. In this subclass, organic acid salts, alcoholates, phenates, chelates or mercaptides are classified as the parent compounds.
5. Compounds containing Se or Te are classified with their sulfur homologues.
6. A hydrocarbon chain is considered to be terminated by a heteroatom or by a carbon atom having three bonds to heteroatoms with at the most one to halogen.
7. When groups, e.g. aromatic or aliphatic groups, are mentioned without further indications, it means that the group concerned can be further substituted. Otherwise it will be indicated, e.g. C07F 9/11 with hydroxyalkyl compounds without further substituents on alkyl.

WARNINGS
1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   C07F 9/6593 covered by C07F 9/65815
2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

<table>
<thead>
<tr>
<th>1/00</th>
<th>Compounds containing elements of Groups 1 or 11 of the Periodic System</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/005</td>
<td>. [without C-Metal linkages]</td>
</tr>
<tr>
<td>1/02</td>
<td>Lithium compounds</td>
</tr>
<tr>
<td>1/04</td>
<td>Sodium compounds</td>
</tr>
<tr>
<td>1/06</td>
<td>Potassium compounds</td>
</tr>
<tr>
<td>1/08</td>
<td>Copper compounds</td>
</tr>
<tr>
<td>1/10</td>
<td>Silver compounds</td>
</tr>
<tr>
<td>1/12</td>
<td>Gold compounds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3/00</th>
<th>Compounds containing elements of Groups 2 or 12 of the Periodic System</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/003</td>
<td>. [without C-Metal linkages]</td>
</tr>
<tr>
<td>3/006</td>
<td>. [Beryllium compounds]</td>
</tr>
<tr>
<td>3/02</td>
<td>Magnesium compounds</td>
</tr>
<tr>
<td>3/04</td>
<td>Calcium compounds</td>
</tr>
<tr>
<td>3/06</td>
<td>Zinc compounds</td>
</tr>
<tr>
<td>3/08</td>
<td>Cadmium compounds</td>
</tr>
<tr>
<td>3/10</td>
<td>Mercury compounds</td>
</tr>
<tr>
<td>3/103</td>
<td>. . [without C-Mercury linkages]</td>
</tr>
<tr>
<td>3/12</td>
<td>. . Aromatic substances containing mercury</td>
</tr>
<tr>
<td>3/14</td>
<td>. . Heterocyclic substances containing mercury</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5/00</th>
<th>Compounds containing elements of Groups 3 or 13 of the Periodic System</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/003</td>
<td>. [without C-Metal linkages]</td>
</tr>
<tr>
<td>5/02</td>
<td>Boron compounds</td>
</tr>
<tr>
<td>5/022</td>
<td>. . [without C-boron linkages]</td>
</tr>
<tr>
<td>5/025</td>
<td>. . [Boronic and borinic acid compounds]</td>
</tr>
<tr>
<td>5/027</td>
<td>. . [Organoboranes and organoborohydrides]</td>
</tr>
<tr>
<td>5/04</td>
<td>. . Esters of boric acids</td>
</tr>
<tr>
<td>5/05</td>
<td>. . Cyclic compounds having at least one ring containing boron but no carbon in the ring</td>
</tr>
<tr>
<td>5/06</td>
<td>. . Aluminium compounds</td>
</tr>
<tr>
<td>5/061</td>
<td>. . [with C-aluminium linkage]</td>
</tr>
<tr>
<td>5/062</td>
<td>. . . [Al linked exclusively to C]</td>
</tr>
<tr>
<td>5/064</td>
<td>. . . [compounds with an Al-Halogen linkage]</td>
</tr>
<tr>
<td>5/065</td>
<td>. . . [compounds with an Al-H linkage]</td>
</tr>
<tr>
<td>5/066</td>
<td>. . . [compounds with Al linked to an element other than Al, C, H or halogen (this includes Al-cyanide linkage)]</td>
</tr>
<tr>
<td>5/067</td>
<td>. . . . [compounds with Al also linked to H or halogen]</td>
</tr>
<tr>
<td>5/068</td>
<td>. . . . [preparation of alumin(ox)anes]</td>
</tr>
<tr>
<td>5/069</td>
<td>. . . . [without C-aluminium linkages]</td>
</tr>
</tbody>
</table>
Compounds containing elements of Groups 4 or 14 of the Periodic System

- Silicon compounds
- Compounds having one or more C—Si linkages
- Organo silicon halides
- Compounds containing nitrogen
- Hydrosilylation reactions
- Compounds having Si-O-C linkages
- Compounds having Si-O-Si sequences

**WARNING**

Group C07F 7/04 is incomplete pending reclassification of documents from group C07F 7/045.

Group C07F 7/04 is impacted by reclassification into groups C07F 7/06 and C07F 7/07.

Groups C07F 7/04, C07F 7/045, C07F 7/06 and C07F 7/07 should be considered in order to perform a complete search.

Esters of silicic acids

**WARNING**

Group C07F 7/045 is no longer used for the classification of documents as of August 1, 2018. The content of this group is being reclassified into groups C07F 7/04, C07F 7/06 and C07F 7/07.

Groups C07F 7/04, C07F 7/045, C07F 7/06 and C07F 7/07 should be considered in order to perform a complete search.

**NOTE**

The silicon atom involved in the reaction that is attached or becomes attached to the highest number of halide atoms determines classification.

- with hydroxyaryl compounds
- Cyclic esters
- Compounds having one or more C—Si linkages
- [General processes]
- [Compounds with Si-C or Si-Si linkages]
- [comprising only Si, C or H atoms]
- [comprising Si as a ring atom]
- [comprising at least one atom selected from the elements N, O, halogen, S, Se or Te]
- [said ring is substituted at a C ring atom by Si]
- [said ring comprising Si as a ring atom]
- [Preparations of compounds not comprising Si-Si or Si-cyanato linkages]
- [Syntheses with formation of a Si-C bond]
- [Hydrosilylation reactions]
- [Syntheses without formation of a Si-C bond]
- [Other preparations]
- [Compounds having one or more O-Si linkage (for compounds with C-O-Si linkages see C07F 7/18)]
- [Compounds with one or more Si-OH or Si-O-metal linkage]
9/00 Compounds containing elements of Groups 5 or 15 of the Periodic System

9/005 [Compounds of elements of Group 5 of the Periodic System without metal-carbon linkages]

9/02 Phosphorus compounds (sugar phosphates C07H 11/04; nucleotides C07H 19/00, C07H 21/00; nucleic acids C07H 21/00)

9/025 [Purification; Separation; Stabilisation; Desorption, etc.]

9/04 Reaction products of phosphorus sulfur compounds with hydrocarbons

9/06 without P—C bonds

9/062 [Organo-phosphoranes without P-C bonds]

9/065 [Phosphoranes containing the structure P=N-N]

9/067 [Polyphosphazenes containing the structure [P=O-N-I] (cyclic compounds C07F 9/65812)]

9/08 [Esters of oxycids of phosphorus [(C07F 9/062 takes precedence)]

9/09 [Esters of phosphoric acids]

9/091 [with hydroxyalkyl compounds with further substituents on alkyl]

9/092 [substituted by B, Si or a metal]

9/093 [Polyol derivatives esterified at least twice by phosphoric rest]

9/094 [with arylalkanols]

9/095 [Compounds containing the structure P(=O)-O-acyl, P(=O)-O-heteroatom, P(=O)-O-CN]

9/096 [Compounds containing the structure P(=O)-O-C(=X)- (X = O, S, Se)]

9/097 [Compounds containing the structure P(=O)-O-N]

9/098 [Esters of polyphosphoric acids or anhydrides]

9/10 Phosphatides, e.g. lecithin

9/103 [Extraction or purification by physical or chemical treatment of natural phosphatides; Preparation of compositions containing phosphatides of unknown structure]

9/106 [Adducts, complexes, salts of phosphatides]

9/11 [with hydroxyalkyl compounds without further substituents on alkyl]

9/113 [with unsaturated acyclic alcohols]

9/117 [with cycloaliphatic alcohols]

9/12 [with hydroxyarynl compounds]

9/14 [containing P(=O)-halide groups]

9/1403 [containing the structure Hal-P(=O)-O-unsaturated acyl rest]

9/1406 [containing the structure Hal-P(=O)-O-arly]

9/141 [Esters of phosphorus acids]

9/1411 [with hydroxyalkyl compounds with further substituents on alkyl]

9/1412 [Polyol derivatives esterified at least twice by phosphorous acid rests]

9/1414 [with arylalkanols]

9/1415 [Compounds containing the structure P-O-acyl, P-O-heteroatom, P-O-CN]

9/1417 [Compounds containing the structure P-O-C(=X)- (X = O, S, Se)]

9/1418 [Compounds containing the structure P-O-N]

9/142 [with hydroxyalkyl compounds without further substituents on alkyl]

9/143 [with unsaturated acyclic alcohols]

9/144 [with cycloaliphatic alcohols]

9/145 [with hydroxyarynl compounds]

9/146 [containing P-halide groups]

9/16 [Esters of thiophosphoric acids or thiophosphoric acids]

9/165 Ester of thiophosphoric acids

9/1651 [with hydroxyalkyl compounds with further substituents on alkyl]

9/1652 [Polyol derivatives esterified at least twice by (thio)phosphoric acid esters]

9/1653 [with arylalkanols]

9/1654 [Compounds containing the structure P(=X)n-X-acyl, P(=X)n-X-heteroatom, P(=X)n-X-CN (X = O, S, Se; n = 0, 1)]

9/1655 [Compounds containing the structure P(=X)n-S-(S)x- (X = O, S, Se; n = 0, 1)]

9/1656 [Compounds containing the structure P(=X)n-C(=X)- (X = O, S, Se; n = 0, 1)]

9/1657 [Compounds containing the structure P(=X)n-X-N (X = O, S, Se; n = 0, 1)]

9/1658 [Esters of thiopolyphosphoric acids or anhydrides]
with hydroxalkyl compounds without further substituents on alkyl
with unsaturated acyclic alcohols
with cycloaliphatic alcohols
with hydroxaryl compounds
containing P-halide groups
[containing the structure Hal-P-X-unsatuated acyclic rest]
[containing the structure Hal-P-X-aryl]
(with hydroxalkyl compounds with further substituents on alkyl)
with hydroxyl compounds without further substituents on alkyl
with unsaturated acyclic alcohols
with cycloaliphatic alcohols
with hydroxaryl compounds
containing P-halide groups
[Amides of acids of phosphorus]
[Phosphorus triamides]
[containing the structure P-isocyanates]
{ containing the structure P-N-N, e.g. azides, hydrazides]
Esters of thiophosphorus acids
characteristic
or a structure which is considered as
or a structure which is considered as
containing P-halide groups
[containing the structure P-N-N, e.g. azides, hydrazides]
Esteramides
[the ester moiety containing a substituent or a structure which is considered as characteristic]
of hydroxalkyl compounds
of unsaturated acyclic alcohols
of cycloaliphatic alcohols
of hydroxaryl compounds
[containing the structure (RX)
(RR'N)P(=Y)-Z-(C)n-Z'-P(=Y)(XR)2 (X = O, S, NR; Y = O, S, electron pair; Z = O, S; Z' = O, S)]
[of arylalkanols]
[Compounds containing the structure
N-P(=X)n-X-acyl, N-P(=X)n-X-heteroatom, N-P(=X)n-X-CN (X = O, S, Se; n = 0, 1)]
[Compounds containing the structure
N-P(=X)n-S-(S)x-(X=O,S,Se; n = 0, 1)]
[containing the structure N-P(=X)n-X-CN (X = O, S, Se; n = 0, 1)]
[the amide moiety containing a substituent or a structure which is considered as characteristic]
of aliphatic amines
of unsaturated acyclic amines
of cycloaliphatic amines
[of aromatic amines (N-C aromatic linkage)]
of aralkylamines
[Compounds containing the structure
P(=X)n-N-acyl, P(=X)n-N-heteroatom,
P(=X)n-N-CN (X = O, S, Se; n = 0, 1)]
[containing the structure P(=X)n-N=S
(X = O, S, Se; n = 0, 1)]
[containing the structure P(=X)n-N-C(=X) (X = O, S, Se; n = 0, 1)]
[containing the structure P(=X)n-N-N (X = O, S, Se; n = 0, 1)]
[containing the structure P(=X)n-N-P
(X = O, S, Se; n = 0, 1)]
containing P-halide groups
(with one or more P—C bonds
Phosphinic acids R2P(=O)(OH);
Thiophosphinic acids {, i.e. R2P(=X)(XH) (X = S, Se)}
[Acyclic saturated acids which can have further substituents on alkyl]
[Acyclic unsaturated acids]
[Cycloaliphatic acids]
[Aromatic acids (P-C aromatic linkage)]
[Poly(thio)phosphinic acids]
[Arylalkanephosphinic acids, e.g. Ar-(CH2)n-P(=X)=X-CN (X = O, S, Se; n =1)]
[Acids containing the structure -C(=X)-P(=X)(XH) or NC-P(=X)(XH), (X = O, S, Se)]
[Pyrophosphinic acids; Phosphinic acid anhydrides]
Esters thereof
[the acid moiety containing a substituent or a structure which is considered as characteristic]
[Esters of acyclic saturated acids which can have further substituents on alkyl]
[Esters of acyclic unsaturated acids]
[Esters of cycloaliphatic acids]
[Esters of aromatic acids (P-C aromatic linkage)]
[Esters of poly(thio)phosphinic acids]
[Esters of arylalkanephosphinic acids]
[esters of acids containing the structure
-C(=X)P(=X)(XH) or NC-P(=X)(XH) (XH), (X = O, S, Se)]
[the ester moiety containing a substituent or a structure which is considered as characteristic]
[Esters with hydroxalkyl compounds]
[Esters with unsaturated acyclic alcohols]
[Esters with cycloaliphatic alcohols]
[Esters with hydroxaryl compounds]
[Esters with arylalkanols]
[Compounds containing the structure
R2P(=X)-X-acyl, R2P(=X)-X-heteroatom, R2P(=X)-X-CN (X = O, S, Se)]
[Halides thereof]
Amides thereof
Phosphinic acids R2P(=O)(OH);
Thiophosphinic acids {, i.e. R2P(=X)(XH) (X = S, Se)}
[not used, see subgroups]
[Acyclic saturated acids which can have further substituents on alkyl]

[N-Phosphonomethylglycine; Salts or complexes thereof]

[Acids containing the structure (RX)2P(=X)-alk-N...P (X = O, S, Se)]

[substituted by B, Si, P or a metal (C07F 9/3839 takes precedence)]

[Acrylic unsaturated acids]

[Cyloaliphatic acids]

[Aromatic acids (P-C aromatic linkage)]

[Polyphosphonic acids]

[containing no further substituents than -PO,H2 groups]

[Acrylic unsaturated derivatives]

[Cycloaliphatic derivatives]

[containing halogen or nitro(so) substituents]

[containing hydroxy substituents in the hydrocarbons radicals]

[containing sulfur substituents]

[containing carboxylic acid or carboxylic acid derivative substituents]

[containing nitrogen substituents, e.g. N....H or N-hydroxycarboxylic acid rest which can be substituted by halogen or nitro(so), N....O, N....S, N....C(=X)- (X =O, S, N....N, N....C(=X)...N (X =O, S))]

[containing substituents selected from B, Si, P (other than -PO,H2 groups) or a metal]

[Arylalkane phosphonic acids (C07F 9/3839 takes precedence)]

[Acids containing the structure -C(=X)- P(=X)(XH)2 or NC-P(=X)(XH)2, (X = O, S, Se)]

[Acids containing the structure -C(=X)- P(=X)(XH)2, (X = O, S, Se)]

[Pyrophosphonic acids; phosphonic acid anhydrides]

[Esters thereof]

[the acid moiety containing a substituent or a structure which is considered as characteristic]

[Esters of acyclic acids which can have further substituents on alkyl]

[Esters containing the structure (RX)2P(=X)-alk-N...P (X = O, S, Se)]

[substituted by B, Si, P or a metal (C07F 9/4025 takes precedence)]

[Esters of acyclic unsaturated acids]

[Esters of cyloaliphatic acids]

[Esters of aromatic acids (P-C aromatic linkage)]

[Esters of poly(thio)phosphonic acids]

[containing no further substituents than -PO,H2 groups in free or esterified form]

[Acrylic unsaturated derivatives]

[Cycloaliphatic derivatives]

[containing halogen or nitro(so) substituents]
C07F

9/443 . . . . . . . . . . . . . . [Amides of acids containing the structure -C(=Y)-P(=X)(XR)-N or NC- (P(=X)(XR)-N )]
9/4434 . . . . . . . . . . . . . . [the ester moiety containing a substituent or a structure which is considered as characteristic]
9/4438 . . . . . . . . . . . . . . [Ester with hydroxalkyl compounds]
9/4442 . . . . . . . . . . . . . . [Esters with unsaturated acyclic alcohols]
9/4446 . . . . . . . . . . . . . . [Esters with cycloaliphatic alcohols]
9/4449 . . . . . . . . . . . . . . [Esters with hydroxyl compounds]
9/4453 . . . . . . . . . . . . . . [Esters with arylalkanols]
9/4457 . . . . . . . . . . . . . . [Compounds containing the structure C-P(=X)(X-acyl)-N, C-P(=X)(X-heteroatom)-N or C-P(=X)(X-CN)-N (X, Y = O, S, Se)]
9/4461 . . . . . . . . . . . . . . [the amide moiety containing a substituent or a structure which is considered as characteristic]
9/4465 . . . . . . . . . . . . . . [of aliphatic amines]
9/4469 . . . . . . . . . . . . . . [of unsaturated acyclic amines]
9/4473 . . . . . . . . . . . . . . [of cycloaliphatic amines]
9/4476 . . . . . . . . . . . . . . [of aromatic amines (N-C aromatic linkage)]
9/448 . . . . . . . . . . . . . . [of aralkylamines]
9/4484 . . . . . . . . . . . . . . [Compounds containing the structure C-P(=X)(N-acyl)-X, C-P(=X)(N-heteroatom)-X or C-P(=X)(N-CN)-X (X = O, S, Se)]
9/4488 . . . . . . . . . . . . . . [Compounds containing the structure P(=X)(N-S-) (X = O, S, Se)]
9/4492 . . . . . . . . . . . . . . [Compounds containing the structure P(=X)(N-C(=X)-) (X = O, S, Se)]
9/4496 . . . . . . . . . . . . . . [Compounds containing the structure P(=X)(N-N-) (X = O, S, Se)]
9/46 . . . . Phosphinous acids R2P=O—OH; Thiophosphinous acids; Aminophosphines R2P-NH2 [including R3P(=O)OH; derivatives thereof]
9/48 . . . . Phosphonous acids R—P(OH)2; Thiophosphonous acids [including RHP(=O)(OH); Derivatives thereof]
9/4808 . . . . . . . . . . . . . . [the acid moiety containing a substituent or structure which is considered as characteristic]
9/4816 . . . . . . . . . . . . . . [Acyclic saturated acids or derivatives which can have further substituents on aky]
9/4825 . . . . . . . . . . . . . . [Acyclic unsaturated acids or derivatives]
9/4833 . . . . . . . . . . . . . . [Cycloaliphatic acids or derivatives]
9/4841 . . . . . . . . . . . . . . [Aromatic acids or derivatives (P-C aromatic linkage)]
9/485 . . . . . . . . . . . . . . [Polyphosphonous acids or derivatives]
9/4858 . . . . . . . . . . . . . . [Acids or derivatives containing the structure -C(=X)-P(=X)2 or NC-P(=X)2 (X = O, S, Se)]
9/4866 . . . . . . . . . . . . . . [the ester moiety containing a substituent or structure which is considered as characteristic]
9/4875 . . . . . . . . . . . . . . [Esters with hydroxaryl compounds]
9/4883 . . . . . . . . . . . . . . [Amides or esterimides thereof, e.g. RP(NR'2)2 or RP(=X)(NR'2)2 (X = O, S)]
9/4891 . . . . . . . . . . . . . . [Monohalide derivatives RP (XR') (Hal) (X = O, S, N) (dihalide derivatives C07F 9/52)]
9/50 . . . . . . . . . . . . . . [Organo-phosphines]
9/5004 . . . . . . . . . . . . . . [Acyclic saturated phosphines]
9/5009 . . . . . . . . . . . . . . [substituted by B, Si, P or a metal (C07F 9/5027 takes precedence)]
9/5013 . . . . . . . . . . . . . . [Acyclic unsaturated phosphines]
9/5018 . . . . . . . . . . . . . . [Cycloaliphatic phosphines]
9/5022 . . . . . . . . . . . . . . [Aromatic phosphines (P-C aromatic linkage)]
9/5027 . . . . . . . . . . . . . . [Polyphosphines]
9/5031 . . . . . . . . . . . . . . [Arylalkane phosphines (C07F 9/5027 takes precedence)]
9/5036 . . . . . . . . . . . . . . [Phosphines containing the structure -C(=X)-P or NC-P]
9/504 . . . . . . . . . . . . . . [Organo-phosphines containing a P-P bond]
9/5045 . . . . . . . . . . . . . . [Complexes or chelates of phosphines with metallic compounds or metals]
9/505 . . . . . . . . . . . . . . [Preparation; Separation; Purification; Stabilisation]
9/5054 . . . . . . . . . . . . . . [by a process in which the phosphorus atom is not involved]
9/5059 . . . . . . . . . . . . . . [by addition of phosphorus compounds to alkenes or alky]s
9/5063 . . . . . . . . . . . . . . [from compounds having the structure P-H or P-Heteroatom, in which one or more of such bonds are converted into P-C bonds (C07F 9/5059 takes precedence)]
9/5068 . . . . . . . . . . . . . . [from starting materials having the structure >P-Hal]
9/5072 . . . . . . . . . . . . . . [from starting materials having the structure P-H (C07F 9/5059 takes precedence)]
9/5077 . . . . . . . . . . . . . . [from starting materials having the structure P-Metal, including R2P-M]+
9/5081 . . . . . . . . . . . . . . [from starting materials having the structure >P-Het, Het being an heteroatom different from Hal or Metal]
9/5086 . . . . . . . . . . . . . . [from phosphonium salts as starting materials]
9/509 . . . . . . . . . . . . . . [by reduction of pentavalent phosphorus derivatives, e.g. -P=X with X = O, S, Se or -P-Hal2]
9/5095 . . . . . . . . . . . . . . [Separation; Purification; Stabilisation]
9/52 . . . . . . . . . . . . . . . [Halophosphines]
9/53 . . . . . . . . . . . . . . [Organo-phosphate oxides; Organo-phosphine thioxides]
9/5304 . . . . . . . . . . . . . . [Acrylic saturated phosphate oxides or thioxides]
9/5308 . . . . . . . . . . . . . . [substituted by B, Si, P or a metal]
9/5312 . . . . . . . . . . . . . . [substituted by a phosphorus atom (C07F 9/5329 takes precedence)]
9/5316 . . . . . . . . . . . . . . [Unsaturated acyclic phosphate oxides or thioxides]
9/532 . . . . . . . . . . . . . . [Cycloaliphatic phosphate oxides or thioxides]
9/5325 . . . . . . . . . . . . . . [Aromatic phosphate oxides or thioxides (P-C aromatic linkage)]
9/5329 . . . . . . . . . . . . . . [Polyphosphine oxides or thi]oxides
9/5333 . . . . . . . . . . . . . . [Arylalkane phosphate oxides or thi]oxides (C07F 9/5329 takes precedence)]
9/5337 . . . . . . . . . . . . . . [Phosphine oxides or thi]oxides containing the structure -C(=X)-P(=X) or NC-P(=X) (X = O, S, Se)
9/5341 . . . . . . . . . . . . . . [Organo-phosphate oxides or thi]oxides containing a P-P bond]
Heterocyclic compounds, e.g. containing hetero atoms having one nitrogen atom as the only ring hetero atoms or sulfur as ring hetero atoms

Quaternary phosphonium compounds

Organophosphoranes

[Phosphoranes containing the structure P=N-C-]

[Phosphoranes containing the structure P=N-]

{Polyporphazenes containing the structure [P=N-N- in cyclic phosphazenes C07F 9/65812]}

Quaternary phosphonium compounds

{Acyclic satisfuted phosphonium compounds]

{substiuted by B, Si, P or a metal]

{substiuted by a phosphorus atom (C07F 9/5449 takes precedence)}

{Acyclic unsaturated phosphonium compounds]

{Cycloaliphatic phosphonium compounds]

{Aromatic phosphonium compounds (P-C aromatic linkage)}

{Polyporphazenes compounds]

{Arylalkane phosphonium compounds]

{Compounds of the type “quasi-phosphonium”, e.g. (C)a-P-(Y)b wherein a +b=4, b=1 and Y=heteroatom, generally N or O}

Heterocyclic compounds, e.g. containing phosphorus as a ring hetero atom

{having nitrogen and selenium with or without oxygen atoms, with or without sulfur, as ring hetero atoms; having nitrogen and tellurium with or without oxygen or sulfur as ring hetero atoms]

having one nitrogen atom as the only ring hetero atom

{Seven-(or more) membered rings]}

{condensed with carbocyclic rings or ring systems]

{the heteroring containing the structure - C(=O)-N-C(=O)- (both carbon atoms belong to the heteroring)]

Three-membered rings

Four-membered rings

{condensed with carbocyclic rings or ring systems]

Five-membered rings

{condensed with carbocyclic rings or carbocyclic ring systems]}

Six-membered rings

{condensed with carbocyclic rings or carbocyclic ring systems]

Pyridine rings

Hydrogenated pyridine rings

Quinoline or hydrogenated quinoline ring systems

Isoquinoline or hydrogenated isoquinoline ring systems

Acridine or hydrogenated acridine ring systems

having two nitrogen atoms as the only ring hetero atoms

Five-membered rings

{condensed with carbocyclic rings or carbocyclic ring systems]

Six-membered rings

{condensed with carbocyclic rings or carbocyclic ring systems]

having oxygen atoms, with or without sulfur, selenium, or tellurium, as the only ring hetero atoms

{the oxygen atom being part of a three-membered ring]
having sulfur atoms, with or without selenium or tellurium atoms, as the only ring hetero atoms

containing at least two different or differently substituted hetero rings neither condensed among themselves nor condensed with a common carbocyclic ring or ring system

containing systems of two or more relevant hetero rings condensed among themselves or condensed with a common carbocyclic ring or ring system, with or without other non-condensed hetero rings

containing the ring system

(containing the ring system

(X = CH₂, O, S, NH) optionally with an additional double bond and/or substituents, e.g. penicillins and analogs)

containing a spiro condensed ring system of the formula where at least one of the atoms X or Y is a hetero atom, e.g. S)

having three or more than three double bonds between ring members or between ring members and non-ring members, e.g. purine or analogs)

containing the ring system, e.g. flavins or analogues)

having phosphorus atoms, with or without nitrogen, oxygen, sulfur, selenium or tellurium atoms, as ring hetero atoms

having phosphorus atoms as the only ring hetero atoms

the ring phosphorus atom being part of a (thio)phosphinic acid ester

one oxygen atom being part of a (thio)phosphonic acid derivative

the ring phosphorus atom being part of a phosphorus oxide or thi oxide

the ring phosphorus atom being part of an organo-phosphorane

the ring phosphorus atom being part of a phosphonium compound

having phosphorus and oxygen atoms as the only ring hetero atoms

esters of oxyacids of phosphorus in which one or more exocyclic oxygen atoms have been replaced by (a) sulfur atom(s))

non-condensed with carbocyclic rings or heterocyclic rings or ring systems

condensed with carbocyclic or heterocyclic rings or ring systems

the molecule containing more than one cyclic phosphorus atom

the cyclic phosphorus atom belonging to more than one ring system

Cyclic esteramides of oxyacids of phosphorus

the ring phosphorus atom being bound to at least one carbon atom

the ring phosphorus atom and one oxygen atom being part of a (thio)phosphinic acid ester:

(X = O, S)

the ring phosphorus atom and, at least, one ring oxygen atom being part of a (thio)phosphonic acid derivative)
Arsenic compounds

Organo-arsenic compounds without As—C bonds

Aliphatic compounds

Aromatic compounds containing hydroxyl groups

Aromatic compounds containing amino groups

Heterocyclic compounds

Arsenic compounds containing one or more pyridine rings

Arsenic compounds containing one or more quinoline ring systems

Arsenic compounds containing one or more isoquinoline ring systems