

ECLA**EUROPEAN CLASSIFICATION****C07F**

ACYCLIC, CARBOCYCLIC OR HETEROCYCLIC COMPOUNDS CONTAINING ELEMENTS OTHER THAN CARBON, HYDROGEN, HALOGEN, OXYGEN, NITROGEN, SULFUR, SELENIUM OR TELLURIUM ([metal-containing porphyrins C07D487/22](#))

[N:
WARNING

]

Notes [C2010.02]

[N: [Notes on the Internal Classification of organo-phosphorus compounds](#)

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C07F1/00

Compounds containing elements of the 1st Group of the Periodic System

C07F1/00B

. [N: without C-Metal linkages]

C07F1/02

. Lithium compounds

C07F1/04

. Sodium compounds

C07F1/06

. Potassium compounds

C07F1/08

. Copper compounds

C07F1/10

. Silver compounds

C07F1/12

. Gold compounds

C07F3/00

Compounds containing elements of the 2nd Group of the Periodic System

C07F3/00B

. [N: without C-Metal linkages]

C07F3/00C

. [N: Beryllium compounds]

C07F3/02

. Magnesium compounds

C07F3/04

. Calcium compounds

C07F3/06

. Zinc compounds

C07F3/08

. Cadmium compounds

C07F3/10

. Mercury compounds

- C07F3/10B . . [N: without C-Mercury linkages]
- C07F3/10C . . [N: Aliphatic substances containing mercury]
- C07F3/12 . . Aromatic substances containing mercury
- C07F3/14 . . Heterocyclic substances containing mercury

C07F5/00 Compounds containing elements of the 3rd Group of the Periodic System

- C07F5/00B . [N: without C-Metal linkages]
- C07F5/00C . [N: Addition and condensation products with amines or phosphines]
- C07F5/02 . Boron compounds
- C07F5/02B . . [N: without C-boron linkages]
- C07F5/02C . . [N: Boronic and borinic acid compounds]
- C07F5/02D . . [N: Organoboranes and organoborohydrides]
- C07F5/04 . . Esters of boric acids
- C07F5/05 . . Cyclic compounds having at least one ring containing boron but no carbon in the ring
- C07F5/06 . Aluminium compounds
- C07F5/06A . . [N: with C-aluminium linkage]
- C07F5/06A3 . . . [N: Al linked exclusively to C]
- C07F5/06A3B [N: compounds containing only Al, C, H and Al is not a ring element]
- C07F5/06A5 . . . [N: compounds with an Al-Halogen linkage]
- C07F5/06A7 . . . [N: compounds with an Al-H linkage]
- C07F5/06A9 . . . [N: compounds with Al linked to an element other than Al, C, H or halogen (this includes Al-cyanide linkage)]
- C07F5/06A9C [N: compounds with Al also linked to H or halogen]
- C07F5/06A9E [N: preparation of alum(in)oxanes]
- C07F5/06B . . [N: without C-aluminium linkages]

C07F7/00 Compounds containing elements of the 4th Group of the Periodic System

- C07F7/00B . [N: without C-Metal linkages]
- C07F7/00B2 . . [N: of group 4B of the Periodic System]
- C07F7/02 . Silicon compounds
- C07F7/02B . . [N: without C-silicon linkages]
- C07F7/04 . . Esters of silicic acids
- C07F7/04B . . . [N: Esters of monosilicic acid]
- C07F7/06 . . . with hydroxyaryl compounds
- C07F7/07 . . . Cyclic esters
- C07F7/08 . . Compounds having one or more C-Si linkages
- C07F7/08B . . . [N: General processes]

C07F7/08C	. . .	[N: Compounds with Si-C or Si-Si linkages]
C07F7/08C4	. . . .	[N: comprising only Si, C or H atoms]
C07F7/08C4B	. . . . .	[N: comprising Si as a ring atom]
C07F7/08C4D	. . . . .	[N: comprising no Si as a ring atom]
C07F7/08C6	. . . .	[N: comprising at least one atom selected from the elements N, O, halogen, S, Se or Te]
C07F7/08C6B	. . . . .	[N: comprising a heterocyclic ring]
C07F7/08C6B4	. . . . .	[N: said ring is substituted at a C ring atom by Si]
C07F7/08C6B6	. . . . .	[N: said ring comprising Si as a ring atom]
C07F7/08C6D	. . . . .	[N: comprising no heterocyclic ring]
C07F7/08C8	. . . .	[N: comprising at least one atom selected from elements other than Si, C, H, N, O, halogen, S, Se or Te]
C07F7/08C10	. . . .	[N: comprising at least one Si-Si linkage]
C07F7/08C12	. . . .	[N: comprising at least one Si-cyano linkage]
C07F7/08C14	. . . .	[N: Preparations of compounds not comprising Si-Si or Si-cyano linkages]
C07F7/08C14B	. . . . .	[N: Syntheses with formation of a Si-C bond]
C07F7/08C14B4	. . . . .	[N: Hydrosilylation reactions]
C07F7/08C14D	. . . . .	[N: Syntheses without formation of a Si-C bond]
C07F7/08C14F	. . . . .	[N: Other preparations]
C07F7/08D	. . .	[N: Compounds having one or more O-Si linkage (for compounds with C-O-Si linkages see C07F7/18)]
C07F7/08D2	. . . .	[N: Compounds with one or more Si-OH or Si-O-metal linkage]
C07F7/08D4	. . . .	[N: Compounds with one or more Si-O-Si sequences] [C9504]
C07F7/08D4E	. . . . .	[N: containing a ring comprising a Si-O-Si sequence (compounds with a ring containing only alternating Si and O atoms, i.e. cyclosiloxanes C07F7/21)] [C9504]
C07F7/08D4E3	. . . . .	[N: also comprising a C atom] [C9504]
C07F7/08D4E3C	. . . . .	{7 dots} [N: also comprising an atom different from Si, O and C] [N9504]
C07F7/08D4H	. . . . .	[N: not containing a ring comprising a Si-O-Si sequence] [C9504]
C07F7/08D4H4	. . . . .	[N: a Si atom of a Si-O-Si sequence being attached only to -O-Si or to a C atom] [C9504]
C07F7/08D4H4B	. . . . .	{7 dots} [N: this C atom being part of a group which contains only C and H] [N9504]
C07F7/08D4H4D	. . . . .	{7 dots} [N: this C atom being part of a group which contains halogen] [N9504]
C07F7/08D4H4F	. . . . .	{7 dots} [N: this C atom being part of a group which contains O] [N9504]
C07F7/08D4H4H	. . . . .	{7 dots} [N: this C atom being part of a group which contains N] [N9504]
C07F7/08D4H4K	. . . . .	{7 dots} [N: this C atom being part of a group which contains an element other than C, H, O, N and halogen] [N9504]
C07F7/08D4H6	. . . . .	[N: a Si atom of a Si-O-Si sequence having linkages other than Si-O-Si or bonds other than Si-C] [C9504]
C07F7/08D4H6B	. . . . .	{7 dots} [N: Si-OX bond, X = H or C] [N9504]
C07F7/08D4H6D	. . . . .	{7 dots} [N: Si-Halogen bond] [N9504]

C07F7/08D4H6F	. . . . .	{7 dots} [N: Si-N bond] [N9504]
C07F7/08D4H6H	. . . . .	{7 dots} [N: Si-O-N bond] [N9504]
C07F7/08D4H6J	. . . . .	{7 dots} [N: Si-H bond] [N9504]
C07F7/08D4H6K	. . . . .	{7 dots} [N: Si-Q bond, Q different from O, N, H and halogen] [N9504]
C07F7/08D4J	. . . . .	[N: Compounds of unknown structure containing a Si-O-Si sequence] [N9504]
C07F7/08D4K	. . . . .	[N: Preparation and treatment thereof] [N9504]
C07F7/08D4K2	. . . . .	[N: Reactions involving a bond of the Si-O-Si linkage] [N9504]
C07F7/08D4K4	. . . . .	[N: Reactions involving the formation of bonds to a Si atom of a Si-O-Si sequence other than a bond of the Si-O-Si linkage] [N9504]
C07F7/08D4K4B	. . . . .	{7 dots} [N: Si-C bond] [N9504]
C07F7/08D4K4B2	. . . . .	{8 dots} [N: Hydrosilylation reactions] [N9504]
C07F7/08D4K4B4	. . . . .	{8 dots} [N: Other reactions] [N9504]
C07F7/08D4K4C	. . . . .	{7 dots} [N: Si-halogen bond] [N9504]
C07F7/08D4K4D	. . . . .	{7 dots} [N: Si-OX bond (X = C or H)] [N9504]
C07F7/08D4K4G	. . . . .	{7 dots} [N: Si-Q bond (Q different from O, C or halogen)] [N9504]
C07F7/08D4K6	. . . . .	[N: Reactions not involving the Si atom of the Si-O-Si sequence] [N9504]
C07F7/08D4K8	. . . . .	[N: Treatments not covered by a preceding group] [N9504]
C07F7/08D5	. . . . .	[N: Compounds with a Si-O-N linkage]
C07F7/08D6	. . . . .	[N: Compounds with a Si-O-O linkage]
C07F7/08H	. . . . .	[N: Compounds with a Si-H linkage]
C07F7/08S	. . . . .	[N: Compounds with a Si-S linkage]
C07F7/10	. . . . .	Containing nitrogen [N: having a Si-N linkage]
C07F7/12	. . . . .	Organo silicon halides
C07F7/12M	. . . . .	[N: Preparation or treatment not provided for in C07F7/14 , C07F7/16 or C07F7/20]
[N: Note The silicon atom involved in the reaction that is attached or becomes attached to the highest number of halide atoms determines classification]		
C07F7/12M2	. . . . .	[N: by reactions involving the formation of Si-C linkages (hydrosilylation reactions C07F7/14 ; direct synthesis C07F7/16)]
C07F7/12M4	. . . . .	[N: by reactions involving the formation of Si-halogen linkages]
C07F7/12M6	. . . . .	[N: by reactions involving both Si-C and Si-halogen linkages, the Si-C and Si-halogen linkages can be to the same or to different Si atoms, e.g. redistribution reactions]
C07F7/12M8	. . . . .	[N: by reactions involving the formation of Si-Y linkages, where Y is not a carbon or halogen atom]
C07F7/12M10	. . . . .	[N: by reactions not affecting the linkages to the silicon atom]
C07F7/12M12	. . . . .	[N: by reactions covered by more than one of the groups C07F7/12M2 to C07F7/12M10 and of which the starting material is unknown or insufficiently determined]
C07F7/14	. . . . .	Preparation thereof from [N: optionally substituted] halogenated silanes and hydrocarbons [N: hydrosilylation reactions]

C07F7/16	. . . .	Preparation thereof from silicon and halogenated hydrocarbons [N: direct synthesis]
C07F7/18	. . .	Compounds having one or more C-Si linkages as well as one or more C-O-Si linkages
C07F7/18C	. . . .	[N: Compounds having Si-O-C linkages (Si-O-acyl linkages C07F7/18D)]
C07F7/18C2	. . . . .	[N: the Si-C and Si-O-C linkages being at different Si atoms]
C07F7/18C4	. . . . .	[N: having (C1)a-Si-(OC2)b linkages, a and b being 1 and a+b = 4, C1 and C2 being hydrocarbon or substituted hydrocarbon radicals]
C07F7/18C4A	. . . . .	[N: a and b being alternatively specified]
C07F7/18C4A2	. . . . .	{7 dots} [N: C1 containing aliphatic or cycloaliphatic unsaturated bonds or heteroatoms]
C07F7/18C4A4	. . . . .	{7 dots} [N: C2 containing aliphatic or cycloaliphatic unsaturated bonds or heteroatoms]
C07F7/18C4A6	. . . . .	{7 dots} [N: C1 and C2 containing aliphatic or cycloaliphatic unsaturated bonds or heteroatoms]
C07F7/18C4A9	. . . . .	{7 dots} [N: compounds not provided for in C07F7/18C4A2 to C07F7/18C4A4]
C07F7/18C4B	. . . . .	[N: a being 1, b being 3]
C07F7/18C4C	. . . . .	[N: a being 2, b being 2]
C07F7/18C4D	. . . . .	[N: a being 3, b being 1]
C07F7/18C4D4	. . . . .	{7 dots} [N: C1 being an unsubstituted acyclic saturated hydrocarbon radical containing less than six carbon atoms, a benzyl radical, a phenyl radical, or a methyl substituted phenyl radical]
C07F7/18C4D4C	. . . . .	{8 dots} [N: C2 being an acyclic, arylaliphatic or a non-condensed aromatic radical containing only carbon, hydrogen, halogen, oxygen, nitrogen or sulfur]
C07F7/18C4D4D	. . . . .	{8 dots} [N: C2 containing cycloaliphatic, heterocyclic or condensed aromatic rings]
C07F7/18C4D4D2	. . . . .	{9 dots} [N: C2 containing an azetidine radical or condensed azetidine radical]
C07F7/18C4D4F	. . . . .	{8 dots} [N: C2 containing elements other than carbon, hydrogen, halogen, oxygen, nitrogen or sulfur]
C07F7/18C6	. . . . .	[N: having (C1)a-Si-(OC2)b linkages, a and b being 1 and a+b = 4 (C1 and C2 having the same meaning as in C07F7/18C4)]
C07F7/18C9	. . . . .	[N: Preparation; Treatments not provided for in C07F7/20]
C07F7/18C9A	. . . . .	[N: by reactions involving the formation of Si-C linkages]
C07F7/18C9B	. . . . .	[N: by reactions involving the formation of Si-O linkages]
C07F7/18C9D	. . . . .	[N: by dismutation]
C07F7/18C9F	. . . . .	[N: by reactions involving the formation of other Si-linkages, e.g. Si-N]
C07F7/18C9G	. . . . .	[N: by reactions not provided for in C07F7/18C9A to C07F7/18C9F]
C07F7/18D	. . . . .	[N: Compounds having one or more Si-O-acyl linkages]
C07F7/20	. . .	Purification, separation
C07F7/21	. .	Cyclic compounds having at least one ring containing silicon, but no carbon in the ring
C07F7/22	. .	Tin compounds
C07F7/22B	. .	[N: Not belonging to the groups C07F7/22C to C07F7/22H]

- C07F7/22C . . [N: Compounds having tin linked only to carbon, hydrogen and/or halogen]
- C07F7/22C2 . . . [N: Compounds having only tin-carbon linkages]
- C07F7/22C3 . . . [N: Compounds having one or more tin-halogen linkages]
- C07F7/22C4 . . . [N: Compounds having one or more tin-hydrogen linkages]
- C07F7/22D . . [N: Compounds having one or more tin-oxygen linkages]
- C07F7/22D2 . . . [N: Compounds not belonging to the groups [C07F7/22D3](#) to [C07F7/22D7](#)]
- C07F7/22D3 . . . [N: Compounds having one or more Sn-O-R linkages (R=H or C, except if C belongs to a carboxyl group)]
- C07F7/22D4 . . . [N: Compounds with a Sn=O linkage]
- C07F7/22D4B [N: Stannoic acids and their esters]
- C07F7/22D5 . . . [N: Tin esters of organic acids]
- C07F7/22D6 . . . [N: Tin esters of inorganic acids]
- C07F7/22D7 . . . [N: Compounds with a Sn-O-metal linkage]
- C07F7/22D7B [N: Compounds containing a Sn-O-Sn linkage]
- C07F7/22E . . [N: Compounds with one or more Sn-S linkages]
- C07F7/22E2 . . . [N: Compounds not belonging to group [C07F7/22E3](#) to [C07F7/22E5](#)]
- C07F7/22E3 . . . [N: Compounds having one or more Sn-S-R linkages (R=H or C, except if C belongs to a carboxyl group)]
- C07F7/22E4 . . . [N: Esters of thiocarboxylic acids and their derivatives]
- C07F7/22E5 . . . [N: Compounds with one or more Sn-S-metal linkages]
- C07F7/22E5B [N: Compounds with one or more Sn-S-Sn linkages]
- C07F7/22F . . [N: Compounds with one or more Sn-N linkages]
- C07F7/22G . . [N: Compounds with one or more Sn-metal linkages]
- C07F7/22G2 . . . [N: Compounds with one or more Sn-Sn linkages]
- C07F7/22H . . [N: Purification, stabilisation, isolation]

- C07F7/24 . [N: Lead compounds]
- C07F7/26 . . Tetra-alkyl lead compounds

- C07F7/28 . Titanium compounds

- C07F7/30 . Germanium compounds

C07F9/00 Compounds containing elements of the 5th Group of the Periodic System

- C07F9/00B . [N: Compounds of elements of group 5B without metal-carbon linkages]

- C07F9/02 . Phosphorus compounds (sugar phosphates [C07H11/04](#); nucleotides [C07H19/00](#), [C07H21/00](#); nucleic acids [C07H21/00](#)) [C9512]
- C07F9/02K . . [N: Purification; Separation; Stabilisation; Desodorisation of organo-phosphorus compounds (of natural phosphatides [C07F9/10K](#); phosphines [C07F9/50Z12](#)) [C9502]

- C07F9/04 . . Reaction products of phosphorus sulfur compounds with hydrocarbons
- C07F9/06 . . without P-C bonds
- C07F9/06B . . . [N: Organo-phosphoranes without P-C bonds]

C07F9/06B2	. . . .	[N: Phosphoranes containing the structure $P=N$]
C07F9/06B2D	. . . . .	[N: Polyphosphazenes containing the structure $[P=N]_n$ (cyclic compounds 9/6581F)]
C07F9/08	. . .	Esters of oxyacids of phosphorus [N: (C07F9/06B takes precedence)]
C07F9/09	. . . .	Esters of phosphoric acids
C07F9/09A1	. . . . .	[N: with hydroxyalkyl compounds with further substituents on alkyl]
C07F9/09A1W	. . . . .	[N: substituted by B, Si or a metal]
C07F9/09A6	. . . . .	[N: Polyol derivatives esterified at least twice by phosphoric rests]
C07F9/09A7	. . . . .	[N: with arylalkanols]
C07F9/09A9	. . . . .	[N: Compounds containing the structure $P(=O)-O$ -acyl, $P(=O)-O$ -heteroatom, $P(=O)-O-CN$]
C07F9/09A9Q	. . . . .	[N: Compounds containing the structure $P(=O)-O-C(=X)-$ ($X = O, S, Se$)]
C07F9/09A9U	. . . . .	[N: Compounds containing the structure $P(=O)-O-N$]
C07F9/09B	. . . . .	[N: Esters of polyphosphoric acids or anhydrides]
C07F9/10	. . . . .	Phosphatides, e.g. lecithin
C07F9/10K	. . . . .	[N: Extraction or purification by physical or chemical treatment of natural phosphatides; Preparation of compositions containing phosphatides of unknown structure] [N9502]
C07F9/10Y	. . . . .	[N: Adducts, complexes, salts of phosphatides] [N9502]
C07F9/11	. . . . .	with hydroxyalkyl compounds without further substituents on alkyl
C07F9/113	. . . . .	with unsaturated acyclic alcohols
C07F9/117	. . . . .	with cycloaliphatic alcohols
C07F9/12	. . . . .	with hydroxyaryl compounds
C07F9/14	. . . . .	containing $P(=O)$ -halide groups
C07F9/14B2	. . . . .	[N: containing the structure $Hal-P(=O)-O$ -unsaturated acyclic rest]
C07F9/14B4	. . . . .	[N: containing the structure $Hal-P(=O)-O$ -aryl]
C07F9/141	. . . .	Esters of phosphorous acids
C07F9/141A1	. . . . .	[N: with hydroxyalkyl compounds with further substituents on alkyl]
C07F9/141A6	. . . . .	[N: Polyol derivatives esterified at least twice by phosphorous acid rests]
C07F9/141A7	. . . . .	[N: with arylalkanols]
C07F9/141A9	. . . . .	[N: Compounds containing the structure $P-O$ -acyl, $P-O$ -heteroatom, $P-O-CN$]
C07F9/141A9Q	. . . . .	[N: Compounds containing the structure $P-O-C(=X)-$ ($X = O, S, Se$)]
C07F9/141A9U	. . . . .	[N: Compounds containing the structure $P-O-N$]
C07F9/142	. . . . .	with hydroxyalkyl compounds without further substituents on alkyl
C07F9/143	. . . . .	with unsaturated acyclic alcohols
C07F9/144	. . . . .	with cycloaliphatic alcohols
C07F9/145	. . . . .	with hydroxyaryl compounds
C07F9/146	. . . . .	containing P -halide groups
C07F9/16	. . .	Esters of thiophosphoric acids or thiophosphorous acids
C07F9/165	. . . .	Esters of thiophosphoric acids
C07F9/165A1	. . . . .	[N: with hydroxyalkyl compounds with further substituents on alkyl]
C07F9/165A6	. . . . .	[N: Polyol derivatives esterified at least twice by (thio)phosphoric acid]

				esters]
C07F9/165A7	.	.	.	[N: with arylalkanols]
C07F9/165A9	.	.	.	[N: Compounds containing the structure $P(=X)_n\text{-X-acyl}$, $P(=X)_n\text{-X-heteroatom}$, $P(=X)_n\text{-X-CN}$ ($X = O, S, Se$; $n = 0, 1$)]
C07F9/165A9M	.	.	.	[N: Compounds containing the structure $P(=X)_n\text{-S-(S)}_x\text{-}$ ($X = O, S, Se$; $n=0,1$; $x \geq 1$)]
C07F9/165A9Q	.	.	.	[N: Compounds containing the structure $P(=X)_n\text{-X-C(=X)-}$ ($X = O, S, Se$; $n = 0, 1$)]
C07F9/165A9U	.	.	.	[N: Compounds containing the structure $P(=X)_n\text{-X-N}$ ($X = O, S, Se$; $n = 0, 1$)]
C07F9/165B	.	.	.	[N: Esters of thiopolyphosphoric acids or anhydrides]
C07F9/17	.	.	.	with hydroxyalkyl compounds without further substituents on alkyl
C07F9/173	.	.	.	with unsaturated acyclic alcohols
C07F9/177	.	.	.	with cycloaliphatic alcohols
C07F9/18	.	.	.	with hydroxyaryl compounds
C07F9/20	.	.	.	containing P-halide groups
C07F9/20B2	.	.	.	[N: containing the structure Hal-P-X-unsaturated acyclic rest]
C07F9/20B4	.	.	.	[N: containing the structure Hal-P-X-aryl]
C07F9/201	.	.	.	Esters of thiophosphorus acids
C07F9/201A1	.	.	.	[N: with hydroxyalkyl compounds with further substituents on alkyl]
C07F9/202	.	.	.	with hydroxyl compounds without further substituents on alkyl
C07F9/203	.	.	.	with unsaturated acyclic alcohols
C07F9/204	.	.	.	with cycloaliphatic alcohols
C07F9/205	.	.	.	with hydroxyaryl compounds
C07F9/206	.	.	.	containing P-halide groups
C07F9/22	.	.	.	Amides of acids of phosphorus
C07F9/22A	.	.	.	[N: Amides of phosphoric acids]
C07F9/22C	.	.	.	[N: Phosphorus triamides]
C07F9/22D	.	.	.	[N: containing the structure P-isocyanates]
C07F9/22E	.	.	.	[N: containing the structure P-N-N, e.g. azides, hydrazides]
C07F9/24	.	.	.	Esteramides
C07F9/24A	.	.	.	[N: the ester moiety containing a substituent or a structure which is considered as characteristic]
C07F9/24A1	.	.	.	[N: of hydroxyalkyl compounds]
C07F9/24A2	.	.	.	[N: of unsaturated acyclic alcohols]
C07F9/24A3	.	.	.	[N: of cycloaliphatic alcohols]
C07F9/24A4	.	.	.	[N: of hydroxyaryl compounds]
C07F9/24A6	.	.	.	[N: containing the structure $(RX)(RR'N)P(=Y)\text{-Z-(C)}_n\text{-Z'-P(=Y)(XR)}_2$ ($X = O, S, NR$; $Y = O, S$, electron pair; $Z = O, S$; $Z' = O, S$)]
C07F9/24A7	.	.	.	[N: of arylalkanols]
C07F9/24A9	.	.	.	[N: Compounds containing the structure $N\text{-P(=X)}_n\text{-X-acyl}$, $N\text{-P(=X)}_n\text{-X-heteroatom}$, $N\text{-P(=X)}_n\text{-X-CN}$ ($X = O, S, Se$; $n = 0, 1$)]
C07F9/24A9M	.	.	.	{ 7 dots } [N: Compounds containing the structure $N\text{-P(=X)}_n\text{-S-(S)}_x\text{-}$ ($X = O, S, Se$; $n=0,1$; $x \geq 1$)]

C07F9/24A9Q	. . . . . {7 dots} [N: containing the structure N-P(=X)n-X-C(=X) (X = O, S, Se; n = 0, 1]
C07F9/24A9U	. . . . . {7 dots} [N: containing the structure N-P(=X)n-X-N (X = O, S, Se; n = 0, 1]
C07F9/24A9W	. . . . . {7 dots} [N: containing the structure N-P(=X)n-X-P (X = O, S, Se; n = 0, 1]
C07F9/24C	. . . . . [N: the amide moiety containing a substituent or a structure which is considered as characteristic]
C07F9/24C1	. . . . . [N: of aliphatic amines]
C07F9/24C2	. . . . . [N: of unsaturated acyclic amines]
C07F9/24C3	. . . . . [N: of cycloaliphatic amines]
C07F9/24C4	. . . . . [N: of aromatic amines (N-C aromatic linkage)]
C07F9/24C7	. . . . . [N: of aralkylamines]
C07F9/24C9	. . . . . [N: 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)]
C07F9/24C9M	. . . . . {7 dots} [N: containing the structure P(=X)n-N-S (X = O, S, Se; n = 0, 1)]
C07F9/24C9Q	. . . . . {7 dots} [N: containing the structure P(=X)n-N-C(=X) (X = O, S, Se; n = 0, 1]
C07F9/24C9U	. . . . . {7 dots} [N: containing the structure P(=X)n-N-N (X = O, S, Se; n = 0, 1]
C07F9/24C9W	. . . . . {7 dots} [N: containing the structure P(=X)n-N-P (X = O, S, Se; n = 0, 1]
C07F9/26	. . . . . containing P-halide groups
C07F9/28	. . . . . with one or more P-C bonds
C07F9/30	. . . . . Phosphinic acids R ₂ P(=O)(OH); Thiophosphinic acids [N: i.e. R ₂ P(=X)(XH) (X = S, Se)]
C07F9/30A1	. . . . . [N: Acyclic saturated acids which can have further substituents on alkyl]
C07F9/30A2	. . . . . [N: Acyclic unsaturated acids]
C07F9/30A3	. . . . . [N: Cycloaliphatic acids]
C07F9/30A4	. . . . . [N: Aromatic acids (P-C aromatic linkage)]
C07F9/30A6	. . . . . [N: Poly(thio)phosphinic acids]
C07F9/30A7	. . . . . [N: Arylalkanephosphinic acids, e.g. Ar-(CH ₂) _n -P(=X)(R)(XH), (X = O, S, Se; n ≥ 1)]
C07F9/30A9	. . . . . [N: Acids containing the structure -C(=X)-P(=X)(R)(XH) or NC-P(=X)(R)(XH), (X = O, S, Se)]
C07F9/30B	. . . . . [N: Pyrophosphinic acids; Phosphinic acid anhydrides]
C07F9/32	. . . . . Esters thereof
C07F9/32A	. . . . . [N: the acid moiety containing a substituent or a structure which is considered as characteristic]
C07F9/32A1	. . . . . [N: Esters of acyclic saturated acids which can have further substituents on alkyl)]
C07F9/32A2	. . . . . [N: Esters of acyclic unsaturated acids]
C07F9/32A3	. . . . . [N: Esters of cycloaliphatic acids]
C07F9/32A4	. . . . . [N: Esters of aromatic acids (P-C aromatic linkage)]
C07F9/32A6	. . . . . [N: Esters of poly(thio)phosphinic acids]

C07F9/32A7	. . . . .	[N: Esters of arylalkanephosphinic acids]
C07F9/32A9	. . . . .	[N: Esters of acids containing the structure -C(=X)-P(=X)(R)(XH) or NC-P(=X)(R)(XH), (X = O, S, Se)]
C07F9/32A9Q	. . . . .	{7 dots} [N: containing the structure -C(=X)-P(=X)(R)(XR), (X = O, S, Se)]
C07F9/32C	. . . . .	[N: the ester moiety containing a substituent or a structure which is considered as characteristic]
C07F9/32C1	. . . . .	[N: Esters with hydroxyalkyl compounds]
C07F9/32C2	. . . . .	[N: Esters with unsaturated acyclic alcohols]
C07F9/32C3	. . . . .	[N: Esters with cycloaliphatic alcohols]
C07F9/32C4	. . . . .	[N: Esters with hydroxyaryl compounds]
C07F9/32C7	. . . . .	[N: Esters with arylalkanols]
C07F9/32C9	. . . . .	[N: Compounds containing the structure R ₂ P(=X)-X-acyl, R ₂ P(=X)-X-heteroatom, R ₂ P(=X)-X-CN (X = O, S, Se)]
C07F9/34	. . . . .	Halides thereof
C07F9/36	. . . . .	Amides thereof
C07F9/38	. . . . .	Phosphonic acids RP(=O)(OH) ₂ ; Thiophosphonic acids [N: i.e. RP(=X)(XH) ₂ (X = S, Se)]
C07F9/38A	. . . . .	[N: not used, see subgroups] [N9703]
C07F9/38A1	. . . . .	[N: Acyclic saturated acids which can have further substituents on alkyl]
C07F9/38A1U	. . . . .	[N: N-Phosphonomethylglycine; Salts or complexes thereof] [N1204]
C07F9/38A1V	. . . . .	[N: Acids containing the structure (RX) ₂ P(=X)-alk-N...P (X = O, S, Se)] [N1204]
C07F9/38A1W	. . . . .	[N: substituted by B, Si, P or a metal (C07F9/38A6 takes precedence)]
C07F9/38A2	. . . . .	[N: Acyclic unsaturated acids]
C07F9/38A3	. . . . .	[N: Cycloaliphatic acids]
C07F9/38A4	. . . . .	[N: Aromatic acids (P-C aromatic linkage)]
C07F9/38A6	. . . . .	[N: Polyphosphonic acids]
C07F9/38A6D	. . . . .	[N: containing no further substituents than -PO ₃ H ₂ groups] [N9703]
C07F9/38A6D2	. . . . .	{7 dots} [N: Acyclic unsaturated derivatives] [N9703]
C07F9/38A6D3	. . . . .	{7 dots} [N: Cycloaliphatic derivatives] [N9703]
C07F9/38A6F	. . . . .	[N: containing halogen or nitro(so) substituents] [N9703]
C07F9/38A6J	. . . . .	[N: containing hydroxy substituents in the hydrocarbon radicals] [C9703]
C07F9/38A6M	. . . . .	[N: containing sulfur substituents] [N9703]
C07F9/38A6Q	. . . . .	[N: containing carboxylic acid or carboxylic acid derivative substituents] [N9703]
C07F9/38A6U	. . . . .	[N: containing nitrogen substituents e.g. N.....H or N-hydrocarbon 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)] [C1208]
C07F9/38A6W	. . . . .	[N: containing substituents selected from B, Si, P (other than -PO ₃ H ₂ groups) or a metal] [N9703]
C07F9/38A7	. . . . .	[N: Arylalkanephosphonic acids (C07F9/38A6 takes precedence)]
C07F9/38A9	. . . . .	[N: Acids containing the structure -C(=X)-P(=X)(XH) ₂ or NC-P(=X)(XH) ₂ , (X = O, S, Se)]
C07F9/38A9Q	. . . . .	[N: Acids containing the structure -C(=X)-P(=X)(XH) ₂ , (X = O, S, Se)]

C07F9/38B	. . . . .	[N: Pyrophosphonic acids; phosphonic acid anhydrides]
C07F9/40	. . . . .	Esters thereof
C07F9/40A	. . . . .	[N: the acid moiety containing a substituent or a structure which is considered as characteristic]
C07F9/40A1	. . . . .	[N: Esters of acyclic acids which can have further substituents on alkyl]
C07F9/40A1V	. . . . .	{7 dots} [N: Esters containing the structure (RX)2P(=X)-alk-N...P (X = O, S, Se)] [N1204]
C07F9/40A1W	. . . . .	{7 dots} [N: substituted by B, Si, P or a metal (C07F9/40A6 takes precedence)]
C07F9/40A2	. . . . .	[N: Esters of acyclic unsaturated acids]
C07F9/40A3	. . . . .	[N: Esters of cycloaliphatic acids]
C07F9/40A4	. . . . .	[N: Esters of aromatic acids (P-C aromatic linkage)]
C07F9/40A6	. . . . .	[N: Esters of poly(thio)phosphonic acids]
C07F9/40A6D	. . . . .	{7 dots} [N: containing no further substituents than -PO3H2 groups in free or esterified form] [N9703]
C07F9/40A6D2	. . . . .	{8 dots} [N: Acyclic unsaturated derivatives] [N9703]
C07F9/40A6D3	. . . . .	{8 dots} [N: Cycloaliphatic derivatives] [N9703]
C07F9/40A6F	. . . . .	{7 dots} [N: containing halogen or nitro(so) substituents] [N9703]
C07F9/40A6J	. . . . .	{7 dots} [N: containing hydroxy substituents in the hydrocarbon radicals] [C9703]
C07F9/40A6M	. . . . .	{7 dots} [N: containing sulfur substituents] [N9703]
C07F9/40A6Q	. . . . .	{7 dots} [N: containing carboxylic acid or carboxylic acid derivative substituents] [N9703]
C07F9/40A6U	. . . . .	{7 dots} [N: containing nitrogen substituents e.g. N.....H or N-hydrocarbon 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)] [C1208]
C07F9/40A6W	. . . . .	{7 dots} [N: containing substituents selected from B, Si, P (other than -PO3H2 groups in free or esterified form), or a metal] [N9703]
C07F9/40A7	. . . . .	[N: Esters of arylalkanephosphonic acids (C07F9/40A6 takes precedence)] [C0912]
C07F9/40A7P	. . . . .	{7 dots} [N: Compounds containing the structure (RY)2P(=X)-CH2]n-C(=O)-(CH2)m-Ar, (X, Y = O, S, Se; n>=1, m>=0]
C07F9/40A9	. . . . .	[N: Esters of acids containing the structure -C(=X)-P(=X)(XR)2 or NC-P(=X)(XR)2, (X = O, S, Se)]
C07F9/40A9Q	. . . . .	{7 dots} [N: Esters of acids containing the structure -C(=X)-P(=X)(XR)2, (X = O, S, Se)]
C07F9/40B	. . . . .	[N: Esters of pyrophosphonic acids; Esters of phosphonic acid anhydrides]
C07F9/40C	. . . . .	[N: the ester moiety containing a substituent or a structure which is considered as characteristic]
C07F9/40C1	. . . . .	[N: Esters with hydroxyalkyl compounds]
C07F9/40C2	. . . . .	[N: Esters with unsaturated acyclic alcohols]
C07F9/40C3	. . . . .	[N: Esters with cycloaliphatic alcohols]
C07F9/40C4	. . . . .	[N: Esters with hydroxyaryl compounds]
C07F9/40C7	. . . . .	[N: Esters with arylalkanols]

C07F9/40C9	. . . . .	[N: Compounds containing the structure P(=X)-X-acyl, P(=X)-X-heteroatom, P(=X)-X-CN (X = O, S, Se)]
C07F9/40C9Q	. . . . .	{7 dots} [N: Compounds containing the structure P(=X)-X-C(=X)- (X = O, S, Se)]
C07F9/40C9U	. . . . .	{7 dots} [N: Compounds containing the structure P(=X)-X-N (X = O, S, Se)]
C07F9/42	. . . . .	Halides thereof
C07F9/42H	. . . . .	[N: Acid or estermonohalides thereof, e.g. RP(=X)(YR)(Hal) (X, Y = O, S; R = H, or hydrocarbon group)]
C07F9/44	. . . . .	Amides thereof
C07F9/44A	. . . . .	[N: the acid moiety containing a substituent or a structure which is considered as characteristic]
C07F9/44A1	. . . . .	[N: Amides of acyclic saturated acids which can have further substituents on alkyl]
C07F9/44A2	. . . . .	[N: Amides of acyclic unsaturated acids]
C07F9/44A3	. . . . .	[N: Amides of cycloaliphatic acids]
C07F9/44A4	. . . . .	[N: Amides of aromatic acids (P-C aromatic linkage)]
C07F9/44A6	. . . . .	[N: Amides of poly (thio)phosphonic acids]
C07F9/44A7	. . . . .	[N: Amides of arylalkanephosphonic acids]
C07F9/44A9	. . . . .	[N: Amides of acids containing the structure -C(=Y)-P(=X)(XR)-N or NC-(P(=X)(XR)-N (X, Y = O, S)]
C07F9/44B	. . . . .	[N: the ester moiety containing a substituent or a structure which is considered as characteristic]
C07F9/44B1	. . . . .	[N: Ester with hydroxyalkyl compounds]
C07F9/44B2	. . . . .	[N: Esters with unsaturated acyclic alcohols]
C07F9/44B3	. . . . .	[N: Esters with cycloaliphatic alcohols]
C07F9/44B4	. . . . .	[N: Esters with hydroxyaryl compounds]
C07F9/44B7	. . . . .	[N: Esters with arylalkanols]
C07F9/44B9	. . . . .	[N: 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)]
C07F9/44C	. . . . .	[N: the amide moiety containing a substituent or a structure which is considered as characteristic]
C07F9/44C1	. . . . .	[N: of aliphatic amines]
C07F9/44C2	. . . . .	[N: of unsaturated acyclic amines]
C07F9/44C3	. . . . .	[N: of cycloaliphatic amines]
C07F9/44C4	. . . . .	[N: of aromatic amines (N-C aromatic linkage)]
C07F9/44C7	. . . . .	[N: of aralkylamines]
C07F9/44C9	. . . . .	[N: 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)]
C07F9/44C9M	. . . . .	{7 dots} [N: Compounds containing the structure P(=X)(N-S-) (X = O, S, Se)]
C07F9/44C9Q	. . . . .	{7 dots} [N: Compounds containing the structure P(=X)(N-C(=X)-) (X = O, S, Se)]
C07F9/44C9U	. . . . .	{7 dots} [N: Compounds containing the structure P(=X)(N-N-) (X = O, S, Se)]
C07F9/46	. . . . .	Phosphinous acids R ₂ -P-OH; Thiophosphinous acids; Aminophosphines R ₂ -P-NH ₂ [N: including R ₂ P(=O)H; derivatives thereof]

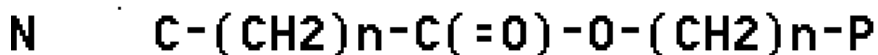
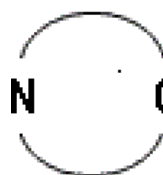
C07F9/48	. . .	Phosphonous acids $\text{RP}(\text{OH})_2$; Thiophosphonous acids [N: including $\text{RHP}(=\text{O})(\text{OH})$; Derivatives thereof]
C07F9/48A	. . . .	[N: the acid moiety containing a substituent or structure which is considered as characteristic]
C07F9/48A1	. . . . .	[N: Acyclic saturated acids or derivatives which can have further substituents on alkyl]
C07F9/48A2	. . . . .	[N: Acyclic unsaturated acids or derivatives]
C07F9/48A3	. . . . .	[N: Cycloaliphatic acids or derivatives]
C07F9/48A4	. . . . .	[N: Aromatic acids or derivatives (P-C aromatic linkage)] [C9512]
C07F9/48A6	. . . . .	[N: Polyphosphonous acids or derivatives]
C07F9/48A9	. . . . .	[N: Acids or derivatives containing the structure $-\text{C}(=\text{X})-\text{P}(\text{XR})_2$ or $\text{NC}-\text{P}(\text{XR})_2$ (X = O, S, Se)]
C07F9/48C	. . . . .	[N: the ester moiety containing a substituent or structure which is considered as characteristic]
C07F9/48C4	. . . . .	[N: Esters with hydroxy aryl compounds]
C07F9/48F	. . . . .	[Amides or esteramides thereof, e.g. $\text{RP}(\text{NR}'_2)_2$ or $\text{RP}(\text{XR}')(\text{NR}''_2)$ (X = O, S)]
C07F9/48H	. . . . .	[N: Monohalide derivatives $\text{RP}(\text{XR}')(\text{Hal})$ (X = O, S, N) (dihalide derivatives C07F9/52)]
C07F9/50	. . .	Organo-phosphines
C07F9/50A1	. . . . .	[N: Acyclic saturated phosphines]
C07F9/50A1W	. . . . .	[N: substituted by B, Si, P or a metal (C07F9/50A6 takes precedence)]
C07F9/50A2	. . . . .	[N: Acyclic unsaturated phosphines]
C07F9/50A3	. . . . .	[N: Cycloaliphatic phosphines]
C07F9/50A4	. . . . .	[N: Aromatic phosphines (P-C aromatic linkage)] [C9512]
C07F9/50A6	. . . . .	[N: Polyphosphines]
C07F9/50A7	. . . . .	[N: Arylalkane phosphines (C07F9/50A6 takes precedence)]
C07F9/50A9	. . . . .	[N: Phosphines containing the structure $-\text{C}(=\text{X})-\text{P}$ or $\text{NC}-\text{P}$]
C07F9/50P	. . . . .	[N: Organo-phosphines containing a P-P bond]
C07F9/50Y	. . . . .	[N: Complexes or chelates of phosphines with metallic compounds or metals]
C07F9/50Z	. . . . .	[N: Preparation; Separation; Purification; Stabilisation]
C07F9/50Z1	. . . . .	[N: by a process in which the phosphorus atom is not involved] [N9410]
C07F9/50Z2	. . . . .	[N: by addition of phosphorus compounds to alkenes or alkynes]
C07F9/50Z4	. . . . .	[N: from compounds having the structure P-H or P-Heteroatom, in which one or more of such bonds are converted into P-C bonds] [C9608] (C07F9/50Z2 takes precedence)
C07F9/50Z4F	. . . . .	[N: from starting materials having the structure $>\text{P}-\text{Hal}$] [N9608]
C07F9/50Z4H	. . . . .	[N: from starting materials having the structure P-H] [N9608] (C07F9/50Z2 takes precedence)
C07F9/50Z4K	. . . . .	[N: from starting materials having the structure P-Metal, including $\text{R}_2\text{P}-\text{M}^+$]
C07F9/50Z4N	. . . . .	[N: from starting materials having the structure $>\text{P}-\text{Het}$, Het being an heteroatom different from Hal or Metal] [N9608]
C07F9/50Z6	. . . . .	[N: from phosphonium salts as starting materials]
C07F9/50Z8	. . . . .	[N: by reduction of pentavalent phosphorus derivatives, e.g. $-\text{P}=\text{X}$ with X]

				= O, S, Se or -P-Hal2] [C9412]
C07F9/50Z12	.	.	.	[N: Separation; Purification; Stabilisation] [N9410]
C07F9/52	.	.	.	Halophosphines
C07F9/53	.	.	.	Organo-phosphine oxides; Organo-phosphine thioxides
C07F9/53A1	.	.	.	[N: Acyclic saturated phosphine oxides or thioxides]
C07F9/53A1W	.	.	.	[N: substituted by B, Si, P or a metal]
C07F9/53A1W2	.	.	.	{7 dots} [N: substituted by a phosphorus atom (C07F9/53A6 takes precedence)]
C07F9/53A2	.	.	.	[N: Unsaturated acyclic phosphine oxides or thioxides]
C07F9/53A3	.	.	.	[N: Cycloaliphatic phosphine oxides or thioxides]
C07F9/53A4	.	.	.	[N: Aromatic phosphine oxides or thioxides (P-C aromatic linkage)] [C9512]
C07F9/53A6	.	.	.	[N: Polyphosphine oxides or thioxides]
C07F9/53A7	.	.	.	[N: Arylalkane phosphine oxides or thioxides (C07F9/53A6 takes precedence)]
C07F9/53A9	.	.	.	[N: Phosphine oxides or thioxides containing the structure -C(=X)-P(=X) or NC-P(=X) (X = O, S, Se)]
C07F9/53P	.	.	.	[N: Organo-phosphine oxides or thioxides containing a P-P bond]
C07F9/53Y	.	.	.	[N: Complexes or chelates of phosphine-oxides or thioxides with metallic compounds or metals]
C07F9/535	.	.	.	Organo-phosphoranes
C07F9/535B	.	.	.	[N: Phosphoranes containing the structure P=C-]
C07F9/535D	.	.	.	[N: Phosphoranes containing the structure P=N-]
C07F9/535D2	.	.	.	[N: Polyphosphazenes containing the structure [P=N-]n (cyclic compounds 9/6581F)]
C07F9/54	.	.	.	Quarternary phosphonium compounds
C07F9/54A1	.	.	.	[N: Acyclic saturated phosphonium compounds]
C07F9/54A1W	.	.	.	[N: substituted by B, Si, P or a metal]
C07F9/54A1W2	.	.	.	[N: substituted by a phosphorus atom (C07F9/54A6 takes precedence)]
C07F9/54A2	.	.	.	[N: Acyclic unsaturated phosphonium compounds]
C07F9/54A3	.	.	.	[N: Cycloaliphatic phosphonium compounds]
C07F9/54A4	.	.	.	[N: Aromatic phosphonium compounds (P-C aromatic linkage)] [C9512]
C07F9/54A6	.	.	.	[N: Polyphosphonium compounds]
C07F9/54A7	.	.	.	[N: Arylalkanephosphonium compounds]
C07F9/54K	.	.	.	[N: 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]
C07F9/547	.	.	.	Heterocyclic compounds, e.g. containing phosphorus as a ring hetero atom
C07F9/547T	.	.	.	[N: having nitrogen and selenium with or without oxygen or sulfur as ring hetero atoms; having nitrogen and tellurium with or without oxygen or sulfur as ring hetero atoms]
C07F9/553	.	.	.	having one nitrogen atom as the only ring hetero atom
C07F9/553A7	.	.	.	[N: Seven-(or more) membered rings]
C07F9/553A7V	.	.	.	[N: condensed with carbocyclic rings or ring systems]
C07F9/553A9	.	.	.	[N: the heteroring containing the structure -C(=O)-N-C(=O)- (both carbon

atoms belong to the heteroring]

- C07F9/564 Three-membered rings
- C07F9/568 Four-membered rings
- C07F9/568E [N: the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms]
- C07F9/568V [N: condensed with carbocyclic rings or ring systems]
- C07F9/572 Five-membered rings
- C07F9/572E [N: the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms]
- C07F9/572G [N: the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.

or

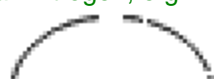


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- C07F9/572K [N: the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.

or

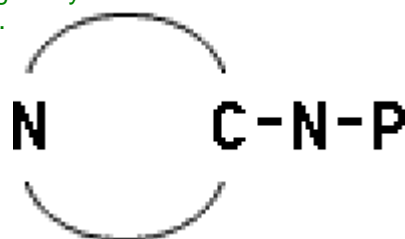
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- C07F9/572K2 [N: bonded through a heteroatom]
- C07F9/572K4 [N: directly bonded]

C07F9/572R

- [N: the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g. or



C07F9/572V

- [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/576

- Six-membered rings

C07F9/576V

- [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/58

- Pyridine rings

C07F9/58E

- [N: the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms]

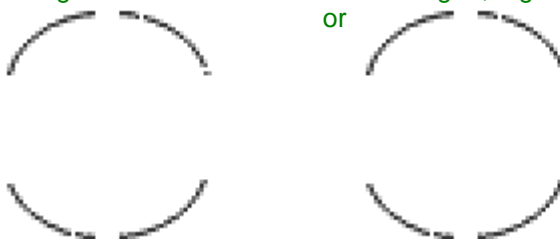
C07F9/58G

- [N: the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g. or



C07F9/58K

- [N: the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g. or]



C07F9/58K2

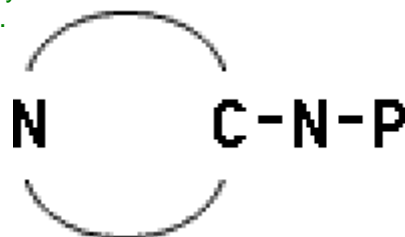
- {7 dots} [N: bonded through a heteroatom]

C07F9/58K4

- {7 dots} [N: directly bonded]

C07F9/58R

. [N: the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g. or



]

C07F9/59

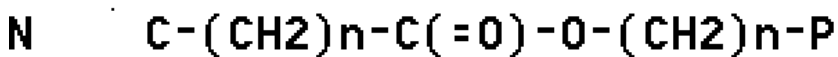
. Hydrogenated pyridine rings

C07F9/59E

. [N: the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms]

C07F9/59G

. [N: the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g. or



]

C07F9/59K

. [N: the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g. or]



C07F9/59K2

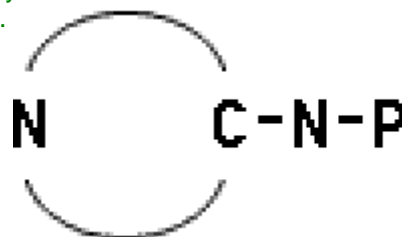
. {7 dots} [N: bonded through a heteroatom]

C07F9/59K4

. {7 dots} [N: directly bonded]

C07F9/59R

. [N: the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g. or



]

C07F9/60

. Quinoline or hydrogenated quinoline ring systems

C07F9/62

. Isoquinoline or hydrogenated isoquinoline ring systems

C07F9/64

. Acridine or hydrogenated acridine ring systems

C07F9/645

. having two nitrogen atoms as the only ring hetero atoms

C07F9/6503

. Five-membered rings

C07F9/6503B2

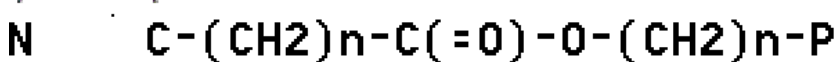
. [N: having the nitrogen atoms in the positions 1 and 2]

C07F9/6503B2E

. [N: the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms]

C07F9/6503B2G

. [N: the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g. or



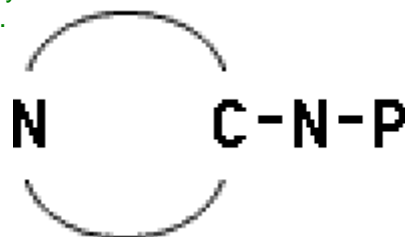
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C07F9/6503B2K

. [N: the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g. or]

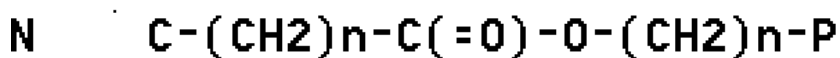
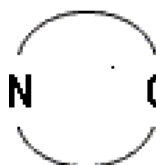


C07F9/6503B2K2	. . . . .	{7 dots} [N: bonded through a heteroatom]
C07F9/6503B2K4	. . . . .	{7 dots} [N: directly bonded]
C07F9/6503B2R	. . . . .	[N: the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g. or



]

C07F9/6503B2V	. . . . .	[N: condensed with carbocyclic rings or carbocyclic ring systems]
C07F9/6506	. . . . .	having the nitrogen atoms in positions 1 and 3
C07F9/6506E	. . . . .	[N: the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms]
C07F9/6506G	. . . . .	[N: the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g. or



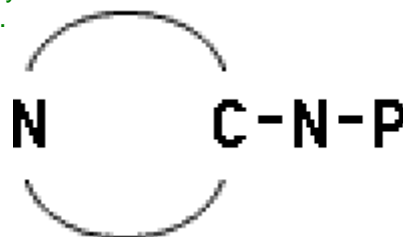
]

C07F9/6506K	[N: the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g. or]
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C07F9/6506K2	{7 dots} [N: bonded through a heteroatom]
C07F9/6506K4	{7 dots} [N: directly bonded]

C07F9/6506R [N: the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g. or



]

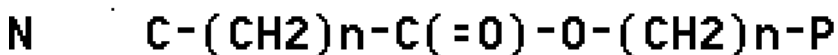
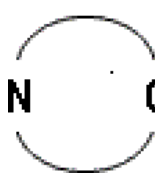
C07F9/6506V [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/6509 Six-membered rings

C07F9/6509B2 [N: having the nitrogen atoms in the positions 1 and 2]

C07F9/6509B2E [N: the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms]

C07F9/6509B2G [N: the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g. or



]

C07F9/6509B2K [N: the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g. or]



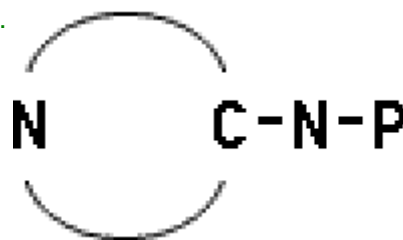
C07F9/6509B2K2 {7 dots} [N: bonded through a heteroatom]

C07F9/6509B2K4 {7 dots} [N: directly bonded]

C07F9/6509B2R [N: the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at

least one nitrogen atom, e.g.

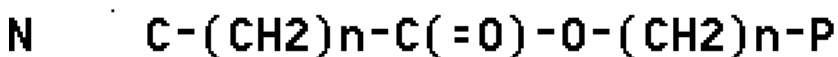
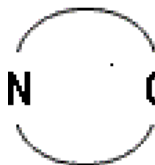
or



]

C07F9/6509B2V	. . . . .	[N: condensed with carbocyclic rings or carbocyclic ring systems]
C07F9/6509B4	. . . . .	[N: having the nitrogen atoms in the position 1 and 4]
C07F9/6509B4E	. . . . .	[N: the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms]
C07F9/6509B4G	. . . . .	[N: the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.

or



]

C07F9/6509B4K	[N: the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.
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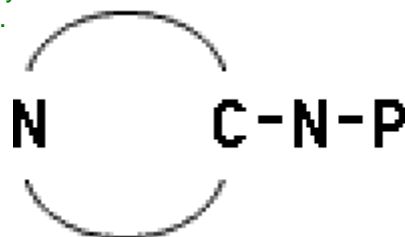
or

]



C07F9/6509B4K2	{7 dots} [N: bonded through a heteroatom]
C07F9/6509B4K4	{7 dots} [N: directly bonded]

C07F9/6509B4R [N: the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g. or



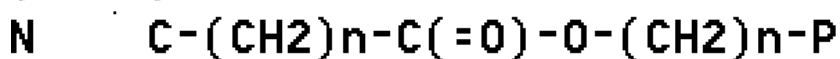
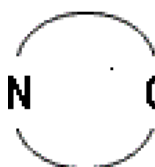
]

C07F9/6509B4V [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/6512 having the nitrogen atoms in positions 1 and 3

C07F9/6512E [N: the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms]

C07F9/6512G [N: the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g. or



]

C07F9/6512K [N: the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g. or]

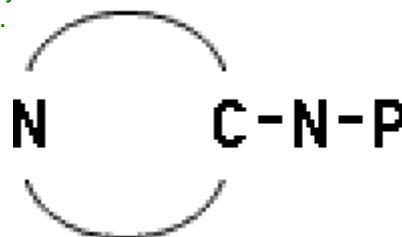


C07F9/6512K2 {7 dots} [N: bonded through a heteroatom]

C07F9/6512K4 {7 dots} [N: directly bonded]

C07F9/6512R

. [N: the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g. or



]

C07F9/6512V

. [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/6515

. . . having three nitrogen atoms as the only ring hetero atoms

C07F9/6518

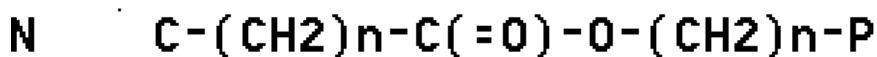
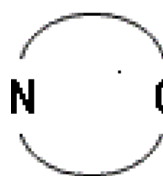
. Five-membered rings

C07F9/6518E

. [N: the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms]

C07F9/6518G

. [N: the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g. or



]

C07F9/6518K

. [N: the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g. or]



C07F9/6518K2

. [N: bonded through a heteroatom]

C07F9/6518K4

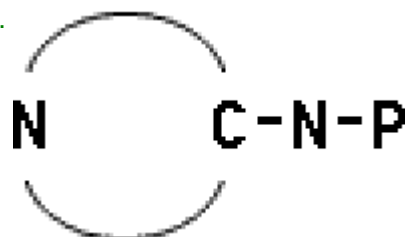
. [N: directly bonded]

C07F9/6518R

. [N: the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least

one nitrogen atom, e.g.

or



]

C07F9/6518V

. [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/6521

. Six-membered rings

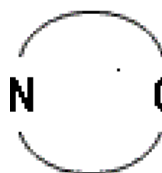
C07F9/6521E

. [N: the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms]

C07F9/6521G

. [N: the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.

or



]

C07F9/6521K

. [N: the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.

or

]



C07F9/6521K2

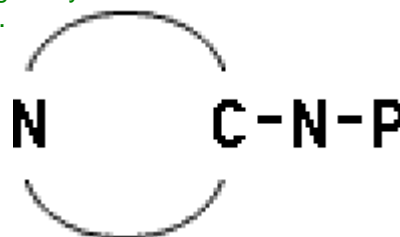
. [N: bonded through a heteroatom]

C07F9/6521K4

. [N: directly bonded]

C07F9/6521R

- [N: the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g. or



C07F9/6521V

- [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/6524

- having four or more nitrogen atoms as the only ring hetero atoms

C07F9/6527

- having nitrogen and oxygen atoms as the only ring hetero atoms

C07F9/653

- Five-membered rings

C07F9/653B

- [N: containing two nitrogen atoms]

C07F9/653B52

- [N: having the two nitrogen atoms in positions 1 and 2]

C07F9/653B53

- [N: having the two nitrogen atoms in positions 1 and 3]

C07F9/653V

- [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/6533

- Six-membered rings

C07F9/6533V

- [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/6536

- having nitrogen and sulfur atoms with or without oxygen atoms, as the only ring hetero atoms

C07F9/6539

- Five-membered rings

C07F9/6539B

- [N: containing two nitrogen atoms]

C07F9/6539B52

- [N: having the two nitrogen atoms in positions 1 and 2]

C07F9/6539B53

- [N: having the two nitrogen atoms in positions 1 and 3]

C07F9/6541

- [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/6544

- Six-membered rings

C07F9/6547

- [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/655

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

C07F9/655J

- [N: the oxygen atom being part of a three-membered ring]

C07F9/655J38

- [N: Phosphonic acids containing oxirane groups; esters thereof]

C07F9/655J60

- [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/655L

- [N: the oxygen atom being part of a four-membered ring]

C07F9/655L60

- [N: condensed with carbocyclic rings or carbocyclic ring systems]

C07F9/655M

- [N: the oxygen atom being part of a five-membered ring]

C07F9/655M60

- [N: condensed with carbocyclic rings or carbocyclic ring systems]

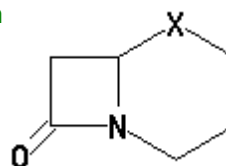
C07F9/655P

- [N: the oxygen atom being part of a six-membered ring]

C07F9/655P60	. . . . .	[N: condensed with carbocyclic rings or carbocyclic ring systems]
C07F9/655R	. . . . .	[N: the oxygen atom being part of a seven-(or more)membered ring]
C07F9/655R60	. . . . .	[N: condensed with carbocyclic rings or carbocyclic ring systems]
C07F9/6553	. . .	having sulfur atoms, with or without selenium or tellurium atoms, as the only ring hetero atoms
C07F9/6553J	. . . . .	[N: the sulfur atom being part of a three-membered ring]
C07F9/6553J60	. . . . .	[N: condensed with carbocyclic rings or carbocyclic ring systems]
C07F9/6553L	. . . . .	[N: the sulfur atom being part of a four-membered ring]
C07F9/6553L60	. . . . .	[N: condensed with carbocyclic rings or carbocyclic ring systems]
C07F9/6553M	. . . . .	[N: the sulfur atom being part of a five-membered ring]
C07F9/6553M60	. . . . .	[N: condensed with carbocyclic rings or carbocyclic ring systems]
C07F9/6553P	. . . . .	[N: the sulfur atom being part of a six-membered ring]
C07F9/6553P60	. . . . .	[N: condensed with carbocyclic rings or carbocyclic ring systems]
C07F9/6553R	. . . . .	[N: the sulfur atom being part of a seven-(or more)membered ring]
C07F9/6553R60	. . . . .	[N: condensed with carbocyclic rings or carbocyclic ring systems]
C07F9/6558	. . .	containing at least two different or differently substituted hetero rings neither condensed among themselves nor condensed with a common carbocyclic ring or ring system
C07F9/6558B	. . . . .	[N: each of the hetero rings containing nitrogen as ring hetero atom]
C07F9/6558C	. . . . .	[N: at least one of the hetero rings does not contain nitrogen as ring hetero atom]
C07F9/6561	. . .	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
C07F9/6561A	. . . . .	[N: containing the ring system (X = CH ₂ , O, S, NH)]

optionally with an additional double bond and/or substituents e.g. penicillins and analogs]

C07F9/6561B	[N: containing the ring system (X = CH ₂ , O, S, NH)]
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optionally with an additional double bond and/or substituents e.g. cephalosporins and analogs]

C07F9/6561C	[N: containing a spiro condensed ring system of the formula
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where at least one of the atoms X or Y is a hetero atom, e.g. S]

C07F9/6561E	[N: containing the ring system	having three or more
		than three double bonds between ring members or between ring members and non-ring members, e.g. purine or analogs]	
C07F9/6561F	. . . .	[N: containing the ring system,	
		e.g. flavins or analogues]	
C07F9/6564	. . .	having phosphorus atoms, with or without nitrogen, oxygen, sulfur, selenium or tellurium atoms, as ring hetero atoms	
C07F9/6568	. . . .	having phosphorus atoms as the only ring hetero atoms	
C07F9/6568B	. . . . .	[N: the ring phosphorus atom being part of a (thio)phosphinic acid or ester thereof]	
C07F9/6568C	. . . . .	[N: the ring phosphorus atom being part of a phosphine]	
C07F9/6568D	. . . . .	[N: the ring phosphorus atom being part of a phosphine oxide or thioxide]	
C07F9/6568E	. . . . .	[N: the ring phosphorus atom being part of an organo-phosphorane]	
C07F9/6568F	. . . . .	[N: the ring phosphorus atom being part of a phosphonium compound]	
C07F9/6571	. . . .	having phosphorus and oxygen atoms as the only ring hetero atoms	
C07F9/6571A	. . . . .	[N: esters of oxyacids of phosphorus in which one or more exocyclic oxygen atoms have been replaced by (a) sulfur atom(s)]	
C07F9/6571A1	. . . . .	[N: non-condensed with carbocyclic rings or heterocyclic rings or ring systems]	
C07F9/6571A4	. . . . .	[N: condensed with carbocyclic or heterocyclic rings or ring systems]	
C07F9/6571A6	. . . . .	[N: the molecule containing more than one cyclic phosphorus atom]	
C07F9/6571A8	. . . . .	[N: the cyclic phosphorus atom belonging to more than one ring system]	
C07F9/6571B	. . . . .	[N: Cyclic esteramides of oxyacids of phosphorus]	
C07F9/6571L	. . . . .	[N: the ring phosphorus atom being bound to at least one carbon atom]	
C07F9/6571L2	. . . . .	[N: the ring phosphorus atom and one oxygen atom being part of a (thio)phosphinic acid ester: (X = O, S)]	
C07F9/6571L4	. . . . .	[N: the ring phosphorus atom and, at least, one ring oxygen atom being part of a (thio)phosphonic acid derivative]	
C07F9/6571L6	. . . . .	[N: the ring phosphorus atom and, at least, one ring oxygen atom being part of a (thio)phosphonous acid derivative]	
C07F9/6574	. . . . .	Esters of oxyacids of phosphorus [N: (C07F9/6571L takes precedence)]	
C07F9/6574A1	. . . . .	[N: non-condensed with carbocyclic rings or heterocyclic rings or ring systems]	

C07F9/6574A4	. . . . .	[N: condensed with carbocyclic or heterocyclic rings or ring systems]
C07F9/6574A6	. . . . .	[N: the molecule containing more than one cyclic phosphorus atom]
C07F9/6574A8	. . . . .	[N: the cyclic phosphorus atom belonging to more than one ring system]
C07F9/6578	. . . . .	having phosphorus and sulfur atoms with or without oxygen atoms, as ring hetero atoms
C07F9/6578D	. . . . .	[N: the ring phosphorus atom and , at least, one ring sulfur atom being part of a thiophosphonic acid derivative]
C07F9/6581	. . . . .	having phosphorus and nitrogen atoms with or without oxygen or sulfur atoms, as ring hetero atoms
C07F9/6581D	. . . . .	[N: having four or more phosphorus atoms as ring hetero atoms]
C07F9/6581F	. . . . .	[N: Cyclic phosphazenes [P=N-] _n , n>=3]
C07F9/6581F2	. . . . .	[N: n = 3 or 4]
C07F9/6581F3	. . . . .	[N: n = 3]
C07F9/6581F4	. . . . .	[N: n = 4]
C07F9/6581F5	. . . . .	[N: n > 4]
C07F9/6584	. . . . .	having one phosphorus atom as ring hetero atom
C07F9/6584A	. . . . .	[N: Cyclic amide derivatives of acids of phosphorus, in which one nitrogen atom belongs to the ring]
C07F9/6584A1	. . . . .	{7 dots} [N: the phosphorus atom being part of a five-membered ring which may be condensed with another ring system]
C07F9/6584A2	. . . . .	{7 dots} [N: the phosphorus atom being part of a six-membered ring which may be condensed with another ring system]
C07F9/6584C	. . . . .	[N: Cyclic amide derivatives of acids of phosphorus, in which two nitrogen atoms belong to the ring]
C07F9/6587	. . . . .	having two phosphorus atoms as ring hetero atoms in the same ring
C07F9/659	. . . . .	having three phosphorus atoms as ring hetero atoms in the same ring [(N: C07F9/6581F takes precedence)]
C07F9/6596	. . . . .	having atoms other than oxygen, sulfur, selenium, tellurium, nitrogen or phosphorus as ring hetero atoms
C07F9/66	. . . . .	Arsenic compounds
C07F9/68	. . . . .	without As-C bonds
C07F9/70	. . . . .	Organo-arsenic compounds
C07F9/70B	. . . . .	[N: Complex metallic compounds]
C07F9/70C	. . . . .	[N: Heterocyclic compounds containing As in the ring]
C07F9/72	. . . . .	Aliphatic compounds
C07F9/72B	. . . . .	[N: As bound only to carbon, hydrogen and/or oxygen]
C07F9/72C	. . . . .	[N: Compounds with chains of As]
C07F9/74	. . . . .	Aromatic compounds
C07F9/74B	. . . . .	[N: As bound only to carbon, hydrogen and/or oxygen]
C07F9/74C	. . . . .	[N: Compounds with chains of As]
C07F9/76	. . . . .	containing hydroxyl groups
C07F9/78	. . . . .	containing amino groups
C07F9/80	. . . . .	Heterocyclic compounds

C07F9/80B	. . . . [N: As bound only to carbon, hydrogen and/or oxygen]
C07F9/80C	. . . . [N: Compounds with chains of As]
C07F9/82	. . . . Arsenic compounds containing one or more pyridine rings
C07F9/84	. . . . Arsenic compounds containing one or more quinoline ring systems
C07F9/86	. . . . Arsenic compounds containing one or more isoquinoline ring systems
C07F9/88	. . . . Arsenic compounds containing one or more acridine ring systems
C07F9/90	. Antimony compounds
C07F9/90B	. . [N: Compounds without antimony-carbon linkages]
C07F9/90C	. . [N: Aliphatic compounds]
C07F9/90D	. . [N: Heterocyclic compounds]
C07F9/90E	. . [N: Complex compounds]
C07F9/92	. . Aromatic compounds
C07F9/94	. Bismuth compounds
C07F11/00	Compounds containing elements of the 6th Group of the Periodic System
C07F11/00B	. [N: compounds without a metal-carbon linkage]
C07F13/00	Compounds containing elements of the 7th Group of the Periodic System
C07F13/00B	. [N: Compounds without a metal-carbon linkage]
C07F15/00	Compounds containing elements of the 8th Group of the Periodic System; [N: General methods of preparation]
C07F15/00N	. [N: compounds of the platinum group]
C07F15/00N1	. . [N: without a metal-carbon linkage]
C07F15/00N2	. . [N: Osmium compounds]
C07F15/00N2B	. . . [N: without a metal-carbon linkage]
C07F15/00N3	. . [N: Iridium compounds]
C07F15/00N3B	. . . [N: without a metal-carbon linkage]
C07F15/00N4	. . [N: Ruthenium compounds]
C07F15/00N4B	. . . [N: without a metal-carbon linkage]
C07F15/00N5	. . [N: Palladium compounds]
C07F15/00N5B	. . . [N: without a metal-carbon linkage]
C07F15/00N6	. . [N: Rhodium compounds]
C07F15/00N6B	. . . [N: without a metal-carbon linkage]
C07F15/00N7	. . [N: Platinum compounds]
C07F15/00N7B	. . . [N: without a metal-carbon linkage]
C07F15/02	. Iron compounds
C07F15/02B	. . [N: without a metal-carbon linkage]

C07F15/03 . . Sideramines; The corresponding desferri compounds

C07F15/04 . Nickel compounds

C07F15/04B . . [N: without a metal-carbon linkage]

C07F15/06 . Cobalt compounds

C07F15/06B . . [N: without a metal-carbon linkage]

C07F17/00 Metalloenes

C07F17/02 . of metals of the iron group or the platinum group

C07F19/00 Metal compounds according to more than one of the preceding main groups

C07F19/00B . [N: without metal-C linkages]