

This heading is primarily concerned with organic compounds containing phosphorus and salts and addition products thereof, and with processes for producing, purifying and stabilising such compounds, and for obtaining them in special physical forms

The heading also embraces bioactive compositions of compounds of the above type in conventional pharmaceutical or pesticidal forms, and other compositions of such compounds *not provided for in other headings*

#### Explanation of subject matter of heading and relationship with other headings

This is the general heading for disclosures relating to organic compounds containing phosphorus and to processes for preparing such compounds

Oligonucleic acids having less than 10 nucleic acid units are dealt with in this heading, *except for* nucleic acid probes which are subject matter for heading C3H, Proteins, enzymes and nucleic acids

The following subject matter, however, is dealt with by the headings indicated:

- . compounds containing phosphorus and silicon—C2R, Organic silicon compounds; C3T, Organo-silicon polymers
- . compounds containing phosphorus and boron, but not silicon—C2B, Organic compounds containing boron
- . organometallic compounds containing phosphorus, but not silicon or boron—C2J, Organometallic compounds

Disclosures concerned with salts or addition products containing boron, silicon or organometallic groups are excluded in the same way as above provided that the boron or silicon is present in an organic component (rather than in an inorganic component only)

Further excluded are:

- . natural or synthetic polymeric materials—*such headings as* C3R, Condensation polymers &c; C3H, Proteins, enzymes and nucleic acids
- . compounds which have dyeing properties, or which have a dyestuff structure and are coloured themselves or become coloured on contact with acidic or alkaline substances—C4P, Dyes and pigments
- . producing organic compounds containing phosphorus of unknown composition using the techniques grouped under the term “combinatorial chemistry”, that is, the synthesis of large arrays (known as “chemical libraries”) of diverse organic compounds containing phosphorus by the systematic and repetitive connection of a set of different structure—C2L, Combinatorial chemistry and chemical libraries
- . . *However* organic compounds containing phosphorous of novel composition produced by combinatorial chemistry are classified in this heading

Disclosure relating to micro-organisms used in preparing organic phosphorus compounds is recorded also by assigning terms from heading C6Y, Indexing schedule for micro-organism information. Details of the indexing practice are given in that schedule

The exclusion references listed in this heading are not exhaustive. Reference should be made to the appropriate general heading/s for processes, materials, elements or devices which may be more widely applicable than can appropriately be classified in this heading

#### Relationship with the Universal Indexing Schedules (heading U1S)

In addition to recording uses and applications of inventions classified here, U1S is used, subject to its indexing rules, to record significant properties of materials with which this heading is concerned. Terms from U1S are assigned in addition to any terms of Indexing Schedule 3 of this heading assigned

#### Operative dates for Key entries

The operative dates of the terms in this heading are:

1. for terms annotated by a marginal code, that of the Edition corresponding to that code
2. for all other terms, earlier than that of Edition A

#### Classifying, indexing and searching notes

1. As from Edition L of the Key, starting materials and intermediates, unless claimed to be novel, are not indexed
2. Elements *other than* carbon forming part of a ring are regarded as substituent elements when they are directly attached to a phosphorus atom, but not otherwise
3. In the case of salts or addition compounds, only those elements or groups present in the organophosphorus fragment or fragments are considered
4. Substituent groups are indexed in accordance with the conventions set forth in heading C2C, Organic compounds, except where otherwise indicated
5. Quaternary phosphorus compounds are indexed solely on the basis of the cation components, the anions being ignored
6. Fused carbocyclic ring systems containing an aromatic ring are indexed only under aromatic ring systems. Quinonoid ring systems not containing an aromatic ring are indexed under alicyclic ring systems. Fused ring systems containing a phosphorus atom are indexed, in respect of chain or ring structure, only as containing phosphorus in a ring (Indexing Schedule 2, term P6)

Classifying, indexing and searching notes—*cont*

7. "Groups containing phosphorus" comprise only a phosphorus atom or atoms together with the elements that are attached directly thereto, whether or not any of these elements (including phosphorus) forms part of a ring. Phosphorus atoms directly linked or separated by only one atom (other than carbon) are regarded as forming part of the same phosphorus-containing group, whilst phosphorus atoms separated by more than one atom or by a single carbon atom are regarded as belonging to separate groups
8. Classifying terms P2E, P2L, P3B and P3C and the terms of Indexing Schedule 1 correspond to terms of Edition K on the following basis: terms P2E, P2L, P3B and P3C are applied to documents that would have been given indexing codes beginning P2E-, P2L-, P3B- and P3C- in Edition K, while the terms of Indexing Schedule 1 correspond to terms having the same ending but beginning P2E-, P2L-, P3B- or P3C- in Edition K. *N.B.* Not all combinations implied by this explanation actually occurred, some being inappropriate, and others existing only as indicated in Indexing Schedule 1

Classifying Schedule 1

special subjects—

. *See also* Indexing Schedules 1, 2 and 3

- |   |            |   |
|---|------------|---|
| 1 | P2A<br>P2N | . compounds containing a cephalosporin, penicillin or naphthacene ring system<br>. nucleotides  |
| 1 | P2P        | . phosphonitriles<br>. <i>Compounds classified here are also classified by the appropriate term from Classifying Schedule 2 below</i> |

Classifying Schedule 2

compounds containing in addition to carbon and phosphorus, and to hydrogen and halogen when these are present, the following substituent element(s)—

. *See also* Indexing Schedules 1, 2 and 3

- |   |     |   |
|---|-----|---|
| 1 | P2E | . nitrogen and oxygen only<br>. cobalamines— <i>See</i> C2V, Vitamins |
|   | P2J | . nitrogen and sulphur only   |
|   | P2K | . nitrogen only   |
| 1 | P2L | . nitrogen, oxygen and sulphur only                                   |
|   | P4  | . no other non-metallic element                                       |
| 1 | P3C | . oxygen and sulphur only   |
| 1 | P3B | . oxygen only   |
|   | P3D | . sulphur only  |
|   | PX  | . other elements  |

Indexing Schedule 1

structures present—

. *This Schedule is applicable with all terms of Classifying Schedules 1 and 2*

. *Prior to Edition L terms corresponding to those of this schedule were applied only in codes corresponding to classifying terms P2E, P2L, P3B and P3C, and in the case of those terms marked with an asterisk, corresponding only to the classifying terms indicated in brackets after the entry—See Classifying, indexing and searching note 8*

. *Compounds of incompletely determined constitution are indexed according to their probable structure and also as compounds of unknown constitution (term P33 below)*

. chain or ring structure—

.. phosphorus-containing rings—*See* Indexing Schedule 2, term P6 below

.. acyclic radicals alone or with phosphorus-containing ring systems—

... no unsaturated carbon-carbon bonds

... one or more unsaturated carbon-carbon bonds

.. carbocyclic rings alone or with phosphorus-containing ring systems—

... alicyclic ring systems

... aromatic ring systems

.. heterocyclic ring systems (*other than* phosphorus-containing ring systems) alone or with other ring systems

. halogen—

.. attached directly to phosphorus

.. attached to acyclic carbon

.. attached to carbon forming part of a ring

\* .. more than one halogen atom attached to the same carbon atom (P3B)

1 P11A

1 P11B

1 P12A

1 P12B

1 P13

1 P18A

1 P18B

1 P18C

1 P18D

Indexing Schedule 1—(*cont*)

- . groups containing phosphorus, but not halogen—  
 . . quaternary phosphorus compounds—*See* Indexing Schedule 2, term P8 *below*  
 . . containing nitrogen also, with or without oxygen and/or sulphur—
- 1 P23 \* . . . containing a carbon-phosphorus bond (P2E)  
 1 P24 \* . . . containing no carbon-phosphorus bond (P2E)  
 1 P25A . . . containing only one nitrogen atom  
 1 P25B . . . containing two or more nitrogen atoms  
 . . containing sulphur also, but not nitrogen, with or without oxygen—
- 1 P27 . . . containing a carbon-phosphorus bond  
 1 P28 . . . containing no carbon-phosphorus bond  
 1 P29A . . . containing only one sulphur atom  
 1 P29B . . . containing two or more sulphur atoms  
 . . containing oxygen also, but not nitrogen or sulphur—
- 1 P14 . . . containing a carbon-phosphorus bond (P2E, P2L, P3C)—
- 1 P14A \* . . . phosphonate groups (comprising only the  $\begin{array}{c} \text{-O} \quad \text{O} \\ \backslash \quad // \\ \text{P} \\ / \quad \backslash \\ \text{-O} \quad \text{C-} \end{array}$  grouping) (P3B)
- . . . . groups containing more than one phosphorus atom—*See* term P14B *below*
- 1 P14B \* . . . other groups (P3B)  
 1 P15 . . . containing no carbon-phosphorus bond—
- 1 P15A \* . . . orthophosphate groups (P2E,P3B)  $\begin{array}{c} \text{-O} \quad \text{O} \\ \backslash \quad / \\ \text{P} \\ / \quad \backslash \\ \text{-O} \quad \text{O-} \end{array}$
- 1 P15B \* . . . orthophosphite groups (P3B)  $\begin{array}{c} \text{-O} \quad \text{O-} \\ \backslash \quad / \\ \text{P-O-} \\ / \quad \backslash \\ \text{-O} \end{array}$  or  $\begin{array}{c} \text{-O} \quad \text{O} \\ \backslash \quad // \\ \text{P} \\ / \quad \backslash \\ \text{-O} \quad \text{H} \end{array}$
- 1 P15C \* . . . other groups (*including* groups containing more than one phosphorus atom) (P2E,P3B)  
 1 P16 \* . . . unesterified or incompletely esterified groups (*other than* salts) (P3B)  
 1 P17 . . not containing nitrogen, oxygen or sulphur  
 1 P20 . more than one phosphorus atom (*in the case of salts, the anion and cation components are indexed separately*)  
 1 P21 \* . no groups *other than* groups containing phosphorus (P3B,P3C)
- . nitrogen-containing groups not containing phosphorus—  
 . . *Oxygen and sulphur attached directly to phosphorus are not considered as forming part of such groups*  
 . . *Nitrogen, except where it forms part of a ring, and carbon where appropriate, attached directly to phosphorus are considered as forming part of such groups as well as of the phosphorus containing group, except that amino groups attached directly to phosphorus are indexed only as groups containing phosphorus*
- 1 P26A . . acylamino groups, not containing sulphur  
 1 P26B . . amino groups  
 1 P26C . . cyano or isocyano groups  
 1 P26D . . nitro groups  
 1 P26F . . sulphur-containing groups  
 1 P26E . . other groups
- . sulphur-containing groups not containing nitrogen or phosphorus—  
 . . *Oxygen and sulphur attached directly to phosphorus are not considered as forming part of such groups*  
 . . *Carbon attached to oxygen or sulphur and also to phosphorus is considered to form part of such groups as well as of the phosphorus-containing groups*
- 1 P30A . . sulfoxide or sulphone groups (comprising only the  $\begin{array}{c} \text{O} \\ | \\ \text{-C-S-C-} \\ | \quad | \\ \text{O} \quad \text{O} \end{array}$  and  $\begin{array}{c} \text{O} \\ || \\ \text{-C-S-C-} \\ || \\ \text{O} \end{array}$  groupings)
- 1 P30B . . thioether groups (comprising only the  $\text{-C-S-C-}$  grouping)  
 1 P30C . . other groups

- . oxygen-containing groups not containing nitrogen, phosphorus or sulphur—
- . . *Oxygen attached directly to phosphorus is not considered as forming part of such groups*
- . . *Carbon attached to oxygen and also to phosphorus is considered to form part of such groups as well as of the phosphorus-containing groups*
- 1 P19G \* . . carboxylic groups (P2L, P3C)—
- 1 P19A \* . . . carboxylic acid groups and salts thereof (P2E, P3B)
- 1 P19B \* . . . carboxylic ester groups (P2E, P3B)
- . . . carboxylic halide groups—*See term P19F below*
- 1 P19C . . etherified hydroxy groups
- \* . . groups *other than* carboxylic groups and etherified hydroxy groups (P2L, P3C *as* P19F)—
- 1 P19D \* . . . free hydroxy groups (*including* alcoholates, enolates and phenolates) (P2E, P3B)
- 1 P19E \* . . . ketonic groups (P2E, P3B)
- 1 P19F \* . . . other groups (P2E, P3B)
- 1 P33 . groups of unknown constitution

### Indexing Schedule 2

further characteristics—

- . *This Schedule is applicable with all terms of Classifying Schedules 1 and 2*
- P5A . addition compounds not containing metallic elements, or nitrogenous organic base salts, *including* quaternary nitrogen salts, the organophosphorus group being in either the anion or cation in the case of salts
- P5B . addition compounds or salts containing metallic elements (*including* ammonium salts, alcoholates, enolates and phenolates)
- P9 . containing acetylenic, olefinic or cycloolefinic unsaturation (*other than* in a heterocyclic ring system)
- . containing halogen—
- P1L1 . . bromine, chlorine or halogens in general
- P1L2 . . fluorine
- P1L3 . . iodine
- P7 . not containing halogen
- P6 . phosphorus in a ring
- P8 . quaternary phosphorus compounds (*including* compounds considered to contain a semi polar carbon phosphorus bond, *eg* phosphorane derivatives, phosphinylides, phosphine methylenes and quasi-phosphonium compounds, the latter *including only* compounds having four organic groups attached to phosphorus and one anionic group)

### Indexing Schedule 3

uses—

- . *This Schedule is applicable with all terms of Classifying Schedules 1 and 2*
- . The terms of the Schedule are assigned in addition to any terms of the Universal Indexing Schedules assigned
- PA . pharmaceutical—
- PA1 . . with carrier or diluent for the active ingredient or in specified formulation
- . . *Compounds containing more than one active ingredient or containing a non-conventional carrier or diluent are indexed also in A5B, Pharmaceutical preparations &c*
- PB . other bio-activity—
- PB1 . . with carrier or diluent for the active ingredient or in specified formulation
- . . *Compounds containing more than one active ingredient or containing a non-conventional carrier or diluent are indexed also in A5E, Pesticides, herbicides, disinfectants &c*
- PC . treating textile materials, fibres, or other absorbent or permeable material
- PD . use as additive for non-fibrous macromolecular materials
- c PE . use in or as a lubricant, hydraulic fluid, or liquid fuel
- c PF . use in or as a surface active agent or composition
- c PG . use as a catalyst
- c PH . use as a chelating, sequestering, or corrosion-inhibiting agent
- c PZ . further use (*other than* as an intermediate)