Introduction

The list contained in this brochure has been produced to facilitate the identification of some scheduled chemicals of particular interest because of their trade or their use.

This is a preliminary list for information purposes only. It is based on information from declarations submitted by States Parties and from open sources.

Information on commercial applications and industrial uses was gathered from a variety of open sources but of course it does not cover all possible applications.

We hope it will be useful for identifying declarable activities and as a general reference.

The list covers 8 different topics:

- **Chemical names and synonyms**: Lists the most common chemical names and synonyms used to identify the same chemical. IUPAC name is indicated.
- **CAS RN**: A CAS Registry Number is a numeric identifier. It can contain up to 9 digits, divided by hyphens into 3 parts. Each CAS Registry Number designate only one substance with a unique numeric identifier.
- **Schedule**: Identifies toxic chemicals and their precursors with 3 digits and a letter as stated in the Convention’s Annex on Chemicals for the application of verification measures.
  - The first digit identifies the schedule list 1, 2 or 3.
- **Molecular formula**: Gives the total number of atoms contained in the chemical.
- **Chemical structure**: Is the graphic representation of the chemical.
- **Commercial applications/Industrial uses**: Compiles some commercial applications and industrial uses collected from a variety of open sources.

The Technical Secretariat would be grateful for further relevant information, and for any comments on the list including notification of errors.

**Declarations Branch, OPCW**

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This edition has been issued in August 2005
**Chemical name:** Sulfur monochloride

**CAS RN:** 10025-67-9

**Molecular formula:** S2Cl2

**Schedule:** 3B12 **HS Code:** 2812.10

**Synonyms:**
- Disulfur dichloride (IUPAC name)
- Thiosulfurous dichloride
- Sulphur chloride (mono)
- Sulfur subchloride
- Sulfur monochloride
- Sulfur monochloride
- Sulfur chloride
- Dichlorodisulfane
- Chlorosulfane
- Chloride of sulfur

**Commercial applications/Industrial uses**

Used in the production of many chemical products, mainly in the manufacture of vulcanising agents for rubber, lubricant additives, gum erasers, rubber additives, rubber substitutes, sulfur dyes, antioxidants, pesticides, herbicides, insecticides, pharmaceuticals, paper and textile auxiliaries, plastics, and in the synthesis of various organic chemicals. The principle commercial uses of this chemical are in the manufacture of lubricant additives and vulcanising agent for rubber.
**Chemical name:** Phosphorous oxychloride

**CAS RN:** 10025-87-3

**Molecular formula:** $\text{POCl}_3$

**Schedule:** 3B05  
**HS Code:** 2812.10

**Synonyms:**
- Phosphoric trichloride (IUPAC name)
- Trichlorophosphorous oxide
- Trichlorophosphine oxide
- Phosphoryl trichloride
- Phosphoryl chloride
- Phosphorus trichloride oxide
- Phosphorus oxytrichloride
- Phosphorus oxychloride
- Phosphorus oxide trichloride
- Phosphorus monoxide trichloride
- Phosphorus chloride oxide
- Phosphoroxyltrichloride
- Phosphoroxychloride
- Phosphoric chloride
- Phosphonyl trichloride

**Chemical structure:**

**Commercial applications/Industrial uses**

Precursor for pesticides, catalyst and reactant. Used to manufacture alkyl and aryl orthophosphate tri-esters, which are used in the production of: hydraulic fluids; plastic and elastomer additives; flame retardant; oil stabilisers; pesticides; medicinal intermediates; metal extraction solvents.
**Chemical name:** Phosphorous pentachloride  
**CAS RN:** 10026-13-8  
**Schedule:** 3B07  
**HS Code:** 2812.10  
**Molecular formula:** PCl5  

**Synonyms:**  
- Pentachlorophosphorane (IUPAC name)  
- Phosphorus(V) chloride  
- Phosphorus perchloride  
- Phosphorus pentachloride  
- Phosphorus chloride  
- Phosphoric chloride  
- Pentachlorophosphorus  
- Pentachlorophosphorane

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**Commercial applications/Industrial uses**

Used as a dehydrating agent for the synthesis of a variety of inorganic and organic phosphorous derivates, water treatment chemicals, flame-retardants, plasticizers, and stabilizers for plastic elastomers, lube oil and paint additives. Used in the pharmaceutical industry in the manufacture of penicillin and cephalosporin antibiotics. In aluminium metallurgy, it is used as a grain refiner for Al-Si alloys and as a grain structure improver in metal casting.
Chemical name: 2-(N,N-Diethylamino)ethanethiol

CAS RN: 100-38-9

Schedule: 2B12   HS Code: 2930.90

Molecular formula: C₆H₁₅NS

Synonyms: 2-(Diethylamino)ethanethiol (IUPAC name)
N,N-Diethylaminoethane-2-thiol
2-N,N-(Diethylamino)ethanethiol
Diethyl(2-mercaptoethyl)amine
N,N-Diethylycysteamine
Diethlycysteamine
2-(Diethylamino)ethyl mercaptan
2-(Diethylamino)ethyl hydrosulfide

Commercial applications/Industrial uses

Production of THS, an antibiotic used for veterinarian application. Raw material for the synthesis of Tiamulin Base.
**Chemical name:** Triethanolamine

**CAS RN:** 102-71-6

**Molecular formula:** C₆H₁₅NO₃

**Synonyms:** 2,2',2''-Nitrilotriethanol (IUPAC name)
Trolamine
Tris(beta-hydroxyethyl)amine
Triethanolamin
TEOA
TEA (amino alcohol)
TEA
Sterolamide
2,2',2''-Nitrilotris[ethanol]
Nitrilotriethanol
tris-(2-Hydroxyethyl)amine
Daltogen
Alkanolamine 244
Tris(2-hydroxyethyl)amine

**Chemical structure:**

![Chemical structure](image)

**Commercial applications/Industrial uses**

Production of: emulsifiers, detergents, textile and leather chemicals, drilling and cutting oils (impregnating materials), medicinal soaps and high-quality cosmetics and toiletries, agricultural products, pharmaceuticals. Production of cleaners: all-purpose cleaners, cleaners that involve skin contact because of the mildness of this chemical, waterless hand cleaners. Production of wax formulations: cream waxes and polishes used for furniture, floors and automotive car wax. Production of cement and concrete: milling additive. Production of adhesives. Application in coatings technology: metal coating preparations, glass coating (shatter proofing, anti-frosting, anti-fogging and dirt resistant films on glass and plastics), accelerator for photo-polymerisation coating (improves thermal properties and reduces cracking in prepared wire coatings). Application as corrosion inhibitor, used in gas purification processes, metal working, mining, petroleum and coal, polymers, textiles, pigment dispersion, pesticides and herbicides.
Chemical name: Sulfur dichloride

CAS RN: 10545-99-0

Molecular formula: SCl2

Synonyms: Sulfur dichloride (IUPAC name)
Sulfur dichloride (SCl2)
Sulfur chloride
Monosulfur dichloride
Dichlorosulfane
Chlorine sulfide (Cl2S)

Schedule: 3B13 HS Code: 2812.10

Commercial applications/Industrial uses

Uses are similar to that of sulfur monochloride. Lubricating oil additives of types similar to those produced using Sulfur monochloride are a significant application for Sulfur dichloride. Also useful in the rapid vulcanisation of rubber, and the cross-linking ability of Sulfur dichloride is also utilized to modify drying oils for varnishes and inks. Used to make an insecticide intermediate (4,4'-thiobisphenol), and is also an ingredient in the production of the fungicide captanol (Difolatan). Used as a chlorinating agent in the manufacture of parathion insecticide intermediates. Is also used in the food industry in the purification of sugar juices.
**Chemical name:** Methyl diethanolamine

**CAS RN:** 105-59-9

**Schedule:** 3B16  
**HS Code:** 2922.19

**Molecular formula:** C5H13NO2

**Synonyms:**  
2,2’-(Methylimino)diethanol (IUPAC name)  
N-Methyliminodiethanol  
Methyliminodiethanol  
N-Methyldiethanolamine  
Methyl diethanolamine  
Methylbis(2-hydroxyethyl)amine  
N-Methyaminodiglycol  
MDEA  
N-(2-Hydroxyethyl)-N-methylethanolamine  
Eve  
Ethanol, 2,2’-(methylimino)di-  
Diethanolmethylamine  
N,N-Bis(2-hydroxyethyl)methylamine  
N-methyl-2,2’-iminodiethanol

**Chemical structure:**

**Commercial applications/Industrial uses**

Treatment of natural gas (removal of acidic components); photographic chemicals; pharmaceutical precursor.
Chemical name: Bis(2-hydroxyethyl)sulfide

CAS RN: 111-48-8

Molecular formula: C4H10O2S

Synonyms:
- 2,2'-Thiodiethanol (IUPAC name)
- Kromfax Solvent
- Bis(β-hydroxyethyl) sulfide
- Bis(2-hydroxyethyl) sulfide
- Bis(2-hydroxyethyl) thioether
- Diethanol sulfide
- β,β'-Dihydroxydiethyl sulfide
- Di(2-hydroxyethyl) sulfide
- Thiodiglycol
- Ethanol, 2,2'-thiodi-
- 2,2'-Thiodiglycol
- Tedegyl
- 3-Thiapentane-1,5-diol
- 2,2'-Thiobisethanol
- Thiodiethyylene glycol
- β-Thiodiglycol
- β,β'-Dihydroxyethyl sulfide

Schedule: HS Code: 2B13 2930.90

Commercial applications/Industrial uses
Textile industry (textile printing and fabric softener); solvents; cosmetics; anti-arthritic drugs; plastics; elastomers; lubricants; stabilizers; antioxidants; inks; dyes; photographic; copying; antistatic agent; epoxides; coating; automotive enamels; metal plating.
**Chemical name:** Trimethyl phosphite  
**CAS RN:** 121-45-9  
**Schedule:** 3B08  
**Molecular formula:** C₃H₉O₃P  
**Synonyms:** Trimethyl phosphite (IUPAC name)  
Trimethoxyphosphine

**Commercial applications/Industrial uses**

Key intermediate in the manufacture of phosphatic pesticides. Is also used as a stabilizer for PVC neoprene and as a raw material in the production of fire resistant and fire retardant materials. Also used as a plasticizer in nylon, as a catalyst in polymerization reaction, and as reagent in organic synthesis. Further uses include: dyestuffs, optical brighteners, plasticizers and lubricants.
**Chemical name:** Triethyl phosphite

**CAS RN:** 122-52-1

**Schedule:** 3B09  
**HS Code:** 2920.90

**Molecular formula:** C6H15O3P

**Synonyms:** Triethyl phosphite (IUPAC name)  
Tris(ethoxy)phosphine  
Triethoxyphosphine

**Chemical structure:**

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**Commercial applications/Industrial uses**

Is used in the manufacture of flame-retardants for rigid polyurethane foam, fluorescent whitening agents, insecticides, and active ingredients for pharmaceuticals (e.g. penicillin). Organic synthesis, plasticizers, lubricant additives. Is converted into insecticidal vinyl esters of phosphoric acid. The long-chained compounds are mainly used as antioxidants for plastics. Is widely used as organophosphorus reagent.
**Chemical name:** Ethyldiethanolamine  
**CAS RN:** 139-87-7  
**Molecular formula:** C₆H₁₅NO₂  
**HS Code:** 2922.19  

**Synonyms:**  
2,2’-(Ethylimino)diethanol (IUPAC name)  
N-Ethyl-2,2’-iminodiethanol  
N-Ethyldiethanolamine  
Ethylbis(2-hydroxyethyl)amine  
Ethanol, 2,2’-(ethylimino)di-  
Diethanoethylamine  
N,N-Bis(2-hydroxyethyl)ethylamine

**Commercial applications/Industrial uses**

Used in pharmaceutical, agricultural, textile, detergent, cosmetic and metallurgic industries. Used mainly as intermediates, especially in the production of pharmaceuticals, crop protection agents and flocculants. Also important in the preparation of chemicals for the paper and leather industries. Use in the production of plastics has risen substantially in recent years. Direct uses include gas purification methods for removing acidic gases.
**Chemical name:** Mixture of CAS RN 41203-81-0 and CAS RN 42595-45-9

**CAS RN:** 170836-68-7

**Schedule:** 2B04

**HS Code:** 3824.90

**Molecular formula:** C15H31O9P3.C9 H2O6P2

**Synonyms:**

**Commercial applications/Industrial uses**

Mixture of CAS 41203-81-0 and CAS 42595-45-9 (cyclic phosphonate esters). Used as a durable flame retardant for polyester fabrics and it is also used in textile coating applications.
**Chemical name:** Phosphonic acid, methyl-, polyglycol ester

**CAS RN:** 294675-51-7

**Schedule:** 2B04

**HS Code:** 2931.00

**Molecular formula:** Unspecified

**Synonyms:**

**Commercial applications/Industrial uses**

Flame retardant in the manufacture of special quality polyurethane foams
**Chemical name:** Saxitoxin  
**CAS RN:** 35523-89-8  
**Molecular formula:** C10H17N7O4  
**Synonyms:** [4R]-10,10-dihydroxy-2,6-diiminooctahydro-1H,8H-pyrrolo[1,2-c]purin-4-yl]methyl carbamate (IUPAC name)  
STX  
Saxitoxin hydrate  
(+)-Saxitoxin  
Saxitoxin  

**HS Code:** 3002.90  
**Schedule:** 1A07  

**Chemical structure:**

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**Commercial applications/Industrial uses**

Small quantities used for medical purposes (Paralytic Shellfish Poisoning)

NOT COMMONLY TRADED
**Chemical name:** 1,1,3,3,3-Pentafluoro-2-(trifluoromethyl)-1-propene

**CAS RN:** 382-21-8

**Molecular formula:** C4F8

**Synonyms:**
1,1,3,3,3-Pentafluoro-2-(trifluoromethyl)prop-1-ene  
(IUPAC name)
Propene, pentafluoro-2-(trifluoromethyl)-
Perfluoro-2-(trifluoromethyl)propene
Perfluoro-2-methylpropene
Perfluoroisobutylene
Perfluoroisobutene
1,1,3,3,3-Pentafluoro-2-(trifluoromethyl)propene
Octafluoroisobutylene
Octafluoroisobutene
1,1-Difluoro-2,2-bis(trifluoromethyl)ethene
PFIB

**Schedule:** 2A02

**HS Code:** 2903.30

**Chemical structure:**

**Commercial applications/Industrial uses**

By product of fluoro-polymers manufacture and perfluoroacetone

NOT COMMONLY TRADED
**Chemical name:** Phosphonic acid, methyl-, (5-ethyl-2-methyl-2-oxido-1,3,2-dioxaphosphorinan-5-yl) methyl methyl ester

**CAS RN:** 41203-81-0

**Schedule:** 2B04  
**HS Code:** 2931.00

**Molecular formula:** C$_9$H$_{20}$O$_6$P$_2$

**Synonyms:**  
(5-ethyl-2-methyl-2-oxido-1,3,2-dioxaphosphinan-5-yl)methyl methyl methylphosphonate (IUPAC name)  
Phosphonothioic acid, methyl-, (5-ethyl-2-methyl-1,3,2-dioxaphosphorinan-5-yl) methyl methyl ester, P-oxide

**Commercial applications/Industrial uses**

Used as a durable flame retardant.
**Chemical name:** Phosphonic acid, methyl-, bis[(5-ethyl-2-methyl-2-oxido-1,3,2-dioxaphosphorinan-5-yl)methyl] ester

**CAS RN:** 42595-45-9

**Schedule:** 2B04  
**HS Code:** 2931.00

**Molecular formula:** C15H31O9P3

**Synonyms:**
- bis[(5-ethyl-2-methyl-2-oxido-1,3,2-dioxaphosphorinan-5-yl)methyl] methylposphonate (IUPAC name)
- Phosphonic acid, methyl-, bis[(5-ethyl-2-methyl-1,3,2-dioxaphosphorinan-5-yl)methyl] ester,P,P'-dioxide

**Chemical structure:**

**Commercial applications/Industrial uses**

Flame retardant
Chemical name: 2-(N,N-Diisopropylamino)ethyl chloride hydrochloride

CAS RN: 4261-68-1

Schedule: 2B10       HS Code: 2921.19

Molecular formula: C8H18ClN.HCl

Synonyms: N-(2-Chloroethyl)-N-isopropylpropan-2-aminium chloride (IUPAC name)
N,N-Diisopropylaminoethyl-2-chloride hydrochloride
Triethylamine, 2''-chloro-1,1'-dimethyl-, hydrochloride
2-(Diisopropylamino)ethyl chloride hydrochloride
(β-Chloroethyl)diisopropylamine hydrochloride
N-(2-Chloroethyl)diisopropylamine hydrochloride

Chemical structure:

Commercial applications/Industrial uses

Pharmaceuticals: Anticancer flavanone analog preparation.
**Chemical name:** 2-(N,N-Dimethylamino)ethyl chloride hydrochloride

**CAS RN:** 4584-46-7

**Schedule:** 2B10  
**HS Code:** 2921.19

**Molecular formula:** C₄H₁₀ClN.HCl

**Synonyms:**
- 2-Chloro-N,N-dimethylethanaminium chloride (IUPAC name)
- 2-Chloroethyl dimethyl ammonium chloride
- 1-Chloro-2-(dimethylamino)ethane hydrochloride
- 2-Chloro-N,N-dimethylethanamine hydrochloride
- 2-Chloro-N,N-dimethylethylamine hydrochloride
- Chloroethylidimethylamine hydrochloride
- N-(2-Chloroethyl)dimethylamine hydrochloride
- N,N-Dimethyl-N-(2-chloroethyl)amine hydrochloride
- Ethylamine, 2-chloro-N,N-dimethyl-, hydrochloride
- 2-Chloroethylidimethylamine monohydrochloride

**Commercial applications/Industrial uses**

Pharmaceuticals; speciality surfactants; flocculants; agricultural chemicals. Pharmaceutical: Pyrrolopyridine preparation, antiinflammatory. Production of Diltiazem. Consumed for the manufacturing of Brompheniramine maleate (Antihistaminic), Chlorphenoxamine HCl (Anticholinergic), Doxilamine succinate (Antihistaminic), Orphenadrine hydrochloride (Muscle relaxant), Orphenadrine citrate (Muscle relaxant), Phenyltoloxamine citrate (Antihistaminic), Chloropiramine hydrochloride.
**Chemical name:** Cyanogen chloride  
**CAS RN:** 506-77-4  
**Molecular formula:** CNCl  
**Schedule:** 3A02  
**HS Code:** 2851.00  

**Synonyms:**  
- Cyanogen chloride (IUPAC name)  
- Cyanochloride  
- Chlorocyanogen  
- Chlorocyanide  
- Chlorocyanide  
- Chlorocyan  
- Chlorine cyanide  
- Chlorine cyanide

**Commercial applications/Industrial uses**  
Chemical synthesis. In metal cleaners, ore refining, production of triazine herbicides (e.g. Atrazine) and insecticides (e.g. Menazon), optical brighteners, dyestuffs and synthetic rubber. Production of diphenylguanidine.
**Chemical name:** Butyl methylphosphinate  
**CAS RN:** 6172-80-1  
**Schedule:** 2B04  
**HS Code:** 2931.00  
**Molecular formula:** C₅H₁₃O₂P  
**Synonyms:** Butyl methylphosphinate (IUPAC name)  
Butyl methanephosphinite  
Butyl methanephosphinate  

**Chemical structure:**

![Chemical Structure](image)

**Commercial applications/Industrial uses**

Raw material for herbicides
**Chemical name:** 3-Quinuclidinyl benzilate  
**CAS RN:** 6581-06-2  
**Schedule:** 2A03  
**HS Code:** 2933.39  
**Molecular formula:** C21H23NO3  
**Synonyms:** 1-Azabicyclo[2.2.2]oct-3-yl hydroxy(diphenyl)acetate (IUPAC name)  
Ro 2-3308  
ß-Quinuclidinyl benzilate  
3-Quinuclidinol, benzilate (ester)  
3-Quinuclidinol benzilate  
QNB  
3-Oxyquinclidine benzilate  
3-Hydroxyquinclidine benzilate  
Benzilic acid, 3-quinuclidinyl ester  
BZ  

**Chemical structure:**

**Commercial applications/Industrial uses**  
Intermediate in the manufacture of pharmaceutical clidinium bromide, which is a co-ingredient with chlordiazepoxide in anticholinergic preparations  
NOT COMMONLY TRADED
Chemical name: Methylphosphonous dichloride

CAS RN: 676-83-5

Schedule: 2B04 HS Code: 2931.00

Molecular formula: CH₃Cl₂P

Synonyms: Methylphosphonous dichloride (IUPAC name)
- Phosphine, dichloromethyl-
- Methylphosphorus dichloride
- Methylphosphinous dichloride
- Methylphosphinic dichloride
- Methylchlorophosphine
- Dichloromethylphosphine

Chemical structure:

Commercial applications/Industrial uses

Used in the production of methyl phosphinic acid. Can be used in synthesis due to reactivity of P-Cl bond as well as trivalent phosphorous itself.
**Chemical name:** Methylphosphonic dichloride  
**CAS RN:** 676-97-1  
**Molecular formula:** CH₃Cl₂OP  
**Schedule:** 2B04  
**HS Code:** 2931.00  

**Synonyms:**  
- Methylphosphonic dichloride (IUPAC name)  
- DC  
- Methylphosphonyl dichloride  
- Methylphosphonyl chloride  
- Methylphosphonodichloridic acid  
- Methylphosphonic acid dichloride  
- Methanephosphonyl dichloride  
- Methanephosphonyl chloride  
- Methanephosphonodichloridic acid  
- Dichloromethylphosphine oxide

**Chemical structure:**

**Commercial applications/Industrial uses**

Chlorinating agent, chemical intermediate.  
Raw material to produce Phosdiol-A and Phospolyol-2, hydroxilated esters of methyl phosphonic acid in oligomeric forms used as fire retardants in self-extinguish mixtures in aircraft industry
**Chemical name:** 2,4,6-Tripropyl-1,3,5,2,4,6-trioxatriphosphinane 2,4,6-trioxide

**CAS RN:** 68957-94-8

**Schedule:** 2B04  
**HS Code:** 2931.00

**Molecular formula:** C₉H₂₁O₆P₃

**Synonyms:**
- Propylphosphonic anhydride
- n-Propylphosphonic cyclic anhydride
- Propylphosphonic anhydride
- 1-Propanephosphonic acid cyclic anhydride, 50% in ethyl acetate
- 1-Propanephosphonic acid cyclic anhydride

**Commercial applications/Industrial uses**

**Chemical name:** Mixture of Dimethyl methylphosphonate, Oxirane and Phosphorus oxide (P2O5)

**CAS RN:** 70715-06-9

**Schedule:** 2B04  
**HS Code:** 3824.90

**Molecular formula:** (C3H9O3P.C2H4O.O5P2)X

**Synonyms:** Phosphorus oxide, polymer with dimethyl methylphosphonate and oxirane  
Dimethyl methylphosphonate, polymer with phosphorus pentoxide and ethylene oxide

**Commercial applications/Industrial uses**

Mixture which is used as a durable flame retardant

**Components:**

Phosphorus Pentoxide (P2O5), Dimethyl methylphosphonate and Oxirane
**Chemical name:** Hydrogen cyanide

**CAS RN:** 74-90-8

**Schedule:** 3A03  
**HS Code:** 2811.19

**Molecular formula:** HCN

**Synonyms:**
- Nitrilomethane (IUPAC name)
- Prussic acid
- Formonitrile
- Formic amononide
- Evercyn
- Carbon hydride nitride (CHN)

**Chemical structure:**

Manufacturing of metal polishes, acrylates, cyanide salts, dyes, rodenticides, pesticides, synthetic fibers, plastics, and electroplating solutions. Used in metallurgical and photographic processes, and to produce cyanuric acid. Used as a starting material for nylon 66. Used to fumigate ships and warehouses, and in ore-extracting processes. It is an intermediate for methyl methacrylate, sodium cyanide, aminopolycarboxylic and acid chelating agents, and a raw material for nitriloacids.
**Chemical name:** Carbonyl dichloride  
**CAS RN:** 75-44-5  
**Schedule:** 3A01  
**HS Code:** 2812.10  
**Molecular formula:** CC\textsubscript{2}O  
**Synonyms:** Carbonyl dichloride (IUPAC name)  
Phosgene  
Phosgen  
Dichloroformaldehyde  
Chloroformyl chloride  
CG  
Carbonyl chloride  
Carbon oxychloride  
Carbon dichloride oxide

**Commercial applications/Industrial uses**

Production of intermediates and products in many branches of large-scale industrial chemistry. Production of di-isocyanates as starting materials of polyurethane chemistry. Polycarbonate resins, Polyurethane coatings. Cholinergic medicines. Chloroformates. The reaction of phosgene with alcohols to form chloroformic esters is very important for industrial applications. These esters are exceptionally versatile intermediates for the production of, for example, carbonic esters, as well as for many other applications (e.g. used in the pharmaceutical industry and in the production of carbamate insecticides). In inorganic chemistry, phosgene is used as an intermediate for the large-scale production of aluminium chloride.
Chemical name: **Dimethyl methylphosphonate**

CAS RN: 756-79-6

Schedule: 2B04

HS Code: 2931.00

**Molecular formula:** C₃H₉O₃PS

**Synonyms:**
- Dimethyl methylphosphonate (IUPAC name)
- Methylphosphonic acid dimethyl ester
- Methanephosphonic acid dimethyl ester
- Metaran
- Fyrol DMMP
- Furan TF 2000
- DMMP
- O,O-Dimethyl methylphosphonate
- Dimethyl methanephosphonate
- Dimethoxymethyl phosphine oxide

**Chemical structure:**

Flame retardant for resins, with application in: building materials, furnishings; transportation equipment and fittings; electrical industry (cables, housing); upholstery; lubricant additive.
Chemical name: Trichloronitromethane

CAS RN: 76-06-2

Schedule: 3A04               HS Code: 2904.90

Molecular formula: CCl3NO2

Synonyms: Trichloro(nitro)methane (IUPAC name)
          PS
          Picfume
          Nitrotrichloromethane
          Nitrochloroform
          Microlysin
          Larvacide
          G 25
          Chlopicrin
          Chloropicrin
          Acquinite

Chemical structure:

Commercial applications/Industrial uses

Mainly used as a soil disinfectant for control of nematodes, soil insects, soil fungi and weed seeds. Is also used for fumigation of stored grain to control insects and rodents, and for glass houses and mushroom house fumigation. Often used in combination with methyl bromide and other fumigants. Is used as a tear gas because of its lachrymatory properties. Is used in the chemical industry as a raw material in organic synthesis, i.e. in manufacturing dyes.
Chemical name: Diethyl phosphite
CAS RN: 762-04-9
Schedule: 3B11
HS Code: 2920.90
Molecular formula: C4H11O3P
Synonyms: Diethyl hydrogen phosphite (IUPAC name)
Hydrogen diethyl phosphite
Diethyl phosphonate
Diethyl hydrogen phosphite
Diethyl acid phosphate
Diethoxyphosphine oxide
CGI 1700

Commercial applications/Industrial uses
Used as a paint solvent, lubricant additive, antioxidant for plastics, reducing agent, intermediate in flame retardants (e.g. in the manufacture of rigid polyurethane foams), and crop protection agents (insecticides), and as a phosphorylating agent. It is a reactive intermediate for use in organic synthesis.
Chemical name: 2,2-Diphenyl-2-hydroxyacetic acid

CAS RN: 76-93-7

Schedule: 2B08 HS Code: 2918.19

Molecular formula: C14H12O3

Synonyms: 2,2-Diphenyl-2-hydroxyacetic acid (IUPAC name)
α-Hydroxy-α-phenylbenzeneacetic acid
2-Hydroxy-2,2-diphenylacetic acid
α-Hydroxy-2,2-diphenylacetic acid
α-Hydroxydiphenylacetic acid
Hydroxydiphenylacetic acid
2,2-Diphenyl-2-hydroxyacetic acid
α,α-Diphenyl-α-hydroxyacetic acid
Diphenylhydroxyacetic acid
α,α-Diphenylglycolic acid
Diphenylglycolic acid
Benzilic acid
Hydroxy(diphenyl)acetic acid

Commercial applications/Industrial uses

**Chemical name:** Thionyl chloride

**CAS RN:** 7719-09-7

**Schedule:** 3B14  
**HS Code:** 2812.10

**Molecular formula:** Cl2OS

**Synonyms:** Thionyl dichloride (IUPAC name)  
Thionyl chloride (SOCl2)  
Sulfur oxychloride (SOCl2)  
Sulfur oxychloride  
Sulfurous oxychloride  
Sulfurous dichloride  
Sulfur chloride oxide (SCl2O)  
Sulfur chloride oxide (Cl2SO)  
Sulfynyl dichloride  
Sulfynyl chloride

**Commercial applications/Industrial uses**

One of the most important chlorinating agents in organic chemistry. Application in the production of: crop-protection agents (herbicides and insecticides); pharmaceuticals (drugs and vitamins); dyes; paper and textile auxiliaries.
Chemical name: Phosphorous trichloride

CAS RN: 7719-12-2

Schedule: 3B06  HS Code: 2812.10

Molecular formula: PCl3

Synonyms: Phosphorous trichloride (IUPAC name)
Trichlorophosphine
Phosphorus chloride (PCl3)
Phosphorus chloride (Cl6P2)
Phosphorous chloride
Phosphine, trichloro-

Commercial applications/Industrial uses

Used as chlorinating agents and catalyst. Starting material in production of organophosphorus and inorganic compounds: phosphoryl chloride, phosphorus pentachloride, phosphonic acid. Reacts with pure oxygen to produce an important intermediate used for the production of: synthetic colourants; pharmaceutical products; organic phosphates (insecticides, fire-retardants, plasticisers, metal extraction solvents).
**Chemical name:** Diethyl ethylphosphonate  
**CAS RN:** 78-38-6  
**Schedule:** 2B04  
**HS Code:** 2931.00  
**Molecular formula:** C6H15O3P  
**Synonyms:**  
Diethyl ethylphosphonate (IUPAC name)  
Diethyl ethanephosphonate  
Diethoxyethylphosphine oxide  
Amsgard V 490  

**Commercial applications/Industrial uses**  
Gasoline additive; raw material for insecticides; flame-proofing agent; stabiliser and antioxidant for plastics.
**Chemical name:** O,O-Diethyl S-2-diethylaminoethyl phosphorothiolate

**CAS RN:** 78-53-5

**Schedule:** 2A01

**HS Code:** 2930.90

**Molecular formula:** C10H24NO3PS

**Synonyms:**
- O,O-Diethyl S-2-diethylaminoethyl phosphorothioate (IUPAC name)
- R 5158
- Metramac
- Inferno
- DSDP
- O,O-Diethyl S-2-diethylaminoethyl phosphorothioate
- O,O-Diethyl S-2-diethylaminoethyl phosphorothiolate
- S-(Diethylaminoethyl) O,O-diethyl phosphorothioate
- Amiton
- S-[2-(diethylamino)ethyl] O,O-diethyl thiophosphate

**Chemical structure:**

**Commercial applications/Industrial uses**

- Insecticide

- NOT COMMONLY TRADED
Chemical name: Mixture: 50% Methylphosphonic acid / 50% (Aminoiminomethyl)urea

CAS RN: 84402-58-4

Schedule: 2B04  HS Code: 3824.90

Molecular formula: C2H6N4O.CH5O
3P

Synonyms: Methylphosphonic acid compound with (aminoiminomethyl)urea (1:1)

Commercial applications/Industrial uses
Flame retardant (specifically for polyesters, polyurethane foams).
Cleaning agents and emulsifiers, textile improvers, anticorrosion agents, fabrics.
**Chemical name:** Sodium 3-(trihydroxysilyl)propyl methylphosphonate

**CAS RN:** 84962-98-1

**Schedule:** 2B04  
**HS Code:** 2931.00

**Molecular formula:** C4H12O6PSi.Na

**Synonyms:**
- Sodium 3-(trihydroxysilyl)propyl methylphosphonate (IUPAC name)
- Methylphosphonic acid mono[3-(trihydroxysilyl)propyl] ester, monosodium salt

**Commercial applications/Industrial uses**

Antifreeze additive
**Chemical name:** Dimethyl phosphite

**CAS RN:** 868-85-9

**Schedule:** 3B10  
**HS Code:** 2920.90

**Molecular formula:** C2H7O3P

**Synonyms:**
- Dimethyl hydrogen phosphite (IUPAC name)
- Methyl phosphonate ((MeO)2HPO)
- Hydrogen dimethyl phosphite
- Dimethyl phosphonate
- Dimethyl hydrogen phosphonate
- Dimethyl hydrogen phosphite
- Dimethyl acid phosphite
- Dimethoxyphosphine oxide
- NCI-C54773
- Dimethylfosfonat
- Dimethylfosfit
- Phosphorous acid dimethyl ester
- O,O-Dimethyl phosphonate
- Dimethylester kyseliny fosforite

**Chemical structure:**

![Chemical structure diagram]

**Commercial applications/Industrial uses**

Main areas of application are in the production of phosphonic acid derivatives, insecticides, and plastic additives. Is required in the manufacture of phosphonates. Is applied in the manufacture of crop protection agents and flame-retardants, e.g. for textile fibers. Organic synthesis: lubricant additive.
Chemical name: 2-(N,N-Diethylamino)ethyl chloride hydrochloride

CAS RN: 869-24-9

Schedule: 2B10  
HS Code: 2921.19

Molecular formula: C6H14ClN.HCl

Synonyms: 2-Chloro-N,N-diethylethanaminium chloride (IUPAC name)
2-(Diethylamino)ethyl chloride hydrochloric acid salt
2-Chloro-N,N-diethylethylamine hydrochloride
N-(2-Chloroethyl)diethylamine hydrochloride
β-Chloroethyldiethylamine hydrochloride
2-Chloroethyl-N,N-diethylamine hydrochloride
(2-Chloroethyl)diethylamine monohydrochloride
2-Chloroethyldiethylammmonium chloride
1-Chloro-2-(diethylamo)ethane hydrochloride
2-Chlorotriethylamine hydrochloride
N,N-Diethylaminooethyl chloride hydrochloride
β-(Diethylamino)ethyl chloride hydrochloride
2-(Diethylamino)ethyl chloride hydrochloride
2-(N,N-Diethylamino)ethyl chloride hydrochloride
N,N-Diethyl-β-chloroethylamine hydrochloride
N,N-Diethyl-2-chloroethylamine hydrochloride
Triethylamine, 2-chloro-, hydrochloride
N-2-Chloroethyl-N,N-diethylammonium hydrochloride

Chemical structure:

Commercial applications/Industrial uses
Gasoline additive; application in the removal of acids from solutions. Production of cationic modified starch.
Manufacture of a pharmaceutical product DEAE-Dextran, active ingredient for a cardiovascular medicament.
Manufacture of Tiamulin derivatives for veterinarian purposes.
Manufacture of Nafronil Oxalate and Drofenine hydrochloride
**Chemical name:** 2-(N,N-Diisopropylamino)ethanol  
**CAS RN:** 96-80-0  
**Schedule:** 2B11  
**HS Code:** 2922.19  
**Molecular formula:** C₈H₁₉NO  
**Synonyms:** 2-Diisopropylaminoethanol (IUPAC name)  
N,N-Diisopropylaminoethane-2-ol  
Ethanol, 2-(diisopropylamino)-  
N,N-Diisopropylethanolamine  
2-(Diisopropylamino)ethyl alcohol  
2-(Diisopropylamino)ethanol  
N,N-Diisopropyl-2-aminoethanol  
(N,N-Diisopropylamino)ethanol  
2-diisopropylaminoethanol

**Commercial applications/Industrial uses**  
Pharmaceuticals: Benzamide preparation; treatment of digestive tract disorder
### Chemicals by Schedule

<table>
<thead>
<tr>
<th>Schedule</th>
<th>CAS</th>
<th>IUPAC name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A07</td>
<td>35523-89-8</td>
<td>Saxitoxin</td>
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<tr>
<td>2A01</td>
<td>78-53-5</td>
<td>O,O-Diethyl S-2-diethylaminoethyl phosphorothiolate</td>
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<td>1,1,3,3,3-Pentafluoro-2-(trifluoromethyl)-1-propene</td>
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<td>3-Quinuclidinyl benzilate</td>
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<td>170836-68-7</td>
<td>Mixture of CAS RN 41203-81-0 and CAS RN 42595-45-9</td>
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<td>Phosphonic acid, methyl-, polyglycol ester</td>
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<tr>
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<td>Phosphonic acid, methyl-, (5-ethyl-2-methyl-2-oxido-1,3,2-dioxaphosphorinan-5-yl) methyl methyl ester</td>
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<td>Phosphonic acid, methyl-, bis[(5-ethyl-2-methyl-2-oxido-1,3,2-dioxaphosphorinan-5-yl)methyl] ester</td>
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<td>Methylphosphonous dichloride</td>
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<td>Methylphosphonic dichloride</td>
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<td>Dimethyl methylphosphonate</td>
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<td>Diethyl ethylphosphonate</td>
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<td>Sodium 3-(trihydroxysilyl)propyl methylphosphonate</td>
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<td>2B08</td>
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<td>2,2-Diphenyl-2-hydroxyacetic acid</td>
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