

Unscheduled Discrete Organic Chemicals (DOCs)

Refers to any chemical belonging to the class of chemical compounds consisting of all compounds of carbon except for its oxides, sulfides and metal carbonates. They are identifiable by chemical name, structural formula (if known) and Chemical Abstracts Services (CAS) Registry Number (if assigned).

This term does not cover:

1. Oligomers & Polymers, whether or not containing Phosphorus, Sulfur or Fluorine
2. Chemicals containing only carbon & metal
3. Carbon monoxide & Carbon dioxide
(as referred in the term "oxides of carbon" in the above definition)
4. Carbon disulfide or Carbonyl sulfide
(as referred in the term "sulfides of carbon" in the above definition)
5. Hydrocarbons
(i.e.: *chemicals containing only Carbon and Hydrogen, irrespective of the number of Carbon atoms in the compound*)
6. Explosives

There are 2 types of unscheduled DOCs:

- **PSF containing**
DOCs containing the elements Phosphorus, Sulfur and/or Fluorine
- **non-PSF containing**
DOCs that do not contain the elements Phosphorus, Sulfur and/or Fluorine

E.g.: *Acetone is a non-PSF containing DOCs;*
Carbon dioxide and Calcium carbonate are not DOCs;
Fluoromethane is a PSF-containing DOCs

Controlled Chemicals under NA(CWC)

- ◆ Schedule 1 Chemicals
- ◆ Schedule 2 Chemicals
- ◆ Schedule 3 Chemicals
- ◆ Unscheduled Discrete Organic Chemicals



For further queries, please contact the NA(CWC) at -

Helpdesk : 6775 5137
Fax : 6775 5946
Email : naofficer@nacwc.gov.sg

Or you may wish to visit our website at:
www.nacwc.gov.sg for more information.

Office of the Director,
National Authority (Chemical Weapons Convention)
20 Science Park Drive
Singapore 118230

Schedule 1A & 1B

Chemical Name	CAS Registry No	HS Code (Product Code)
Schedule 1A		
1. O-Alkyl (\leq C10, including cycloalkyl) alkyl (Me, Et, n-Pr or i-Pr)-phosphonofluoridates <i>e.g.: Sarin Soman</i>	107-44-8 96-64-0	2931 00 90 (S1AN01)
2. O-Alkyl (\leq C10, including cycloalkyl) N, N-dialkyl (Me, Et, n-Pr or i-Pr) phosphoramidocyanidates <i>e.g.: Tabun</i>	77-81-6	2931 0090 (S1AN02)
3. O-Alkyl (H or \leq C10, including cycloalkyl) S-2-dialkyl (Me, Et, n-Pr or i-Pr)-aminoethyl alkyl (Me, Et, n-Pr or i-Pr) phosphonothiolates and corresponding alkylated or protonated salts <i>e.g.: VX</i>	50782-69-9	2930 90 00 (S1AN03)
4. Sulphur mustards: 2-Chloroethylchloromethylsulfide Mustard gas: Bis(2-chloroethyl)sulfide Bis(2-chloroethylthio)methane Sesquimustard: 1,2-Bis(2-chloroethylthio)ethane 1,3-Bis(2-chloroethylthio)-n-propane 1,4-Bis(2-chloroethylthio)-n-butane 1,5-Bis(2-chloroethylthio)-n-pentane Bis(2-chloroethylthiomethyl)ether O-Mustard: Bis(2-chloroethylthioethyl)ether	2625-76-5 505-60-2 63869-13-6 3563-36-8 63905-10-2 142868-93-7 142868-94-8 63918-90-1 63918-89-8	2930 9000 (S1AB01) (S1AB02) (S1AB03) (S1AB04) (S1AB05) (S1AB06) (S1AB07) (S1AB08) (S1AB09)
5. Lewisites: Lewsite 1: 2-Chlorovinylchloroarsine Lewsite 2: Bis(2-chlorovinyl)chloroarsine Lewsite 3: Tris(2-chlorovinyl)arsine	541-25-3 40334-69-8 40334-70-1	2931 0090 (S1AB10) (S1AB11) (S1AB12)
6. Nitrogen mustards: HN1: Bis(2-chloroethyl)ethylamine HN2: Bis(2-chloroethyl)methylamine HN3: Tris(2-chloroethyl)amine	538-07-8 51-75-2 555-77-1	2921 1900 (S1AB13) (S1AB14) (S1AB15)
7. Saxitoxin	35523-89-8	3002 9000 (S1AT01)
8. Ricin	9009-86-3	3002 90 00 (S1AT02)
Schedule 1B		
9. Alkyl (Me, Et, n-Pr or i-Pr) phosphonyl difluorides <i>e.g. DF</i>	676-99-3	2931 0090 (S1BN01)
10. O-Alkyl (H or \leq C10, including cycloalkyl) O-2-dialkyl (Me, Et, n-Pr or i-Pr)-aminoethyl alkyl (Me, Et, n-Pr or i-Pr)-phosphonites and corresponding alkylated or protonated salts <i>e.g. QL</i>	57856-11-8	2931 0090 (S1BN02)
11. Chlorosarin: O-Isopropyl methylphosphonochloridate	1445-76-7	2931 0090 (S1BN03)
12. Chlorosoman: O-Pinacolyl methylphosphonochloridate	7040-57-5	2931 0090 (S1BN04)

- A total of 12 chemicals or groups of chemicals
- Type of chemicals: Chemical Warfare agents & their final-stage precursors
- Little or no commercial applications

Some possible product categories that may use Schedule 1 Chemicals:

- Pesticide development
- Insecticide development
- Medicinal & pharmaceutical preparations
 - antineoplastic agents
 - neuromuscular blocking agents
 - monoclonal antibody preparations
 - intermediates for analgesics
- Flame-retardant additive research (plastics, resins, fibres)

Schedule 2A & 2B

Chemical Name	CAS Registry No	HS Code (Product Code)
Schedule 2A		
1. Amiton: O,O-Diethyl S-[2-(diethylamino)ethyl] phosphorothiolate and corresponding alkylated or protonated salts	78-53-5	2930 9000 (S2AN01)
2. PFIB: 1,1,3,3,3-Pentafluoro-2-(trifluoromethyl)-1-propene	382-21-8	2903 3090 (S2AT01)
Schedule 2A*		
3. BZ: 3-Quinuclidinyl benzoate	6581-06-2	2933 3990 (S2AT02)
Schedule 2B		
4. Chemicals, except for those listed in Schedule 1, containing a phosphorus atom to which is bonded one methyl, ethyl or propyl (normal or iso) group but not further carbon atoms <i>e.g.: Methylphosphonyl dichloride Dimethyl methylphosphonate</i> Exemption: Fonofos: O-Ethyl S-phenyl ethylphosphonothiothionate	676-97-1 756-79-6 944-22-9	2931 0090 (S2BN01)
5. N,N-Dialkyl (Me, Et, n-Pr or i-Pr) phosphoramidic dihalides		2929 9090 (S2BN02)
6. Dialkyl (Me, Et, n-Pr or i-Pr) N,N-dialkyl (Me, Et, n-Pr or i-Pr)-phosphoramidates		2929 9090 (S2BN03)
7. Arsenic trichloride	7784-34-1	2812 1000 (S2BB01)
8. 2,2-Diphenyl-2-hydroxyacetic acid: Benzilic acid	76-93-7	2918 1900 (S2BT01)
9. Quinuclidin-3-ol	1619-34-7	2933 3990 (S2BT02)
10. N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethyl-2-chlorides and corresponding protonated salts		2921 1900 (S2BB02)
11. N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethane-2-ols and corresponding protonated salts Exemptions: N,N-Dimethylaminoethanol and corresponding protonated salts N,N-Diethylaminoethanol and corresponding protonated salts	108-01-0 100-37-8	2922 1990 (S2BB03)
12. N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethane-2-thiols and corresponding protonated salts		2930 9000 (S2BN04)
13. Thiodiglycol: Bis(2-hydroxyethyl)sulfide	111-48-8	2930 9000 (S2BB05)
14. Pinacolyl alcohol: 3,3-Dimethylbutan-2-ol	464-07-3	2905 1990 (S2BN05)

- A total of 14 chemicals or groups of chemicals
- Type of chemicals: Potential Chemical Warfare agents & other chemical weapons precursors
- Have moderate number of commercial applications

Some possible product categories that may use Schedule 2 Chemicals:

- Insecticides
- Flame retardant additive research (plastics, resins, fibres)
- Medical & pharmaceutical preparations
 - anticholinergics
 - arsenicals
 - tranquilliser preparations
 - hypotensive agent preparations
- Herbicides
- Fungicides
- Defoliant
- Rodenticides
- General product additives, inter alia:
 - antioxidants (fuels, lubricants, etc.)
 - colour stabilisers
 - lubricant additives
 - antistatic agents
- Dyes, and photographic industries
 - printing ink
 - ball point pen fluids
 - copy mediums
 - paints, coatings, etc.
- Metal plating preparations
- Toiletries including perfumes and scents
- Epoxy resins

Schedule 3A & 3B

Chemical Name	CAS Registry No	HS Code (Product Code)
Schedule 3A		
1. Phosgene: Carbonyl dichloride	75-44-5	2812 1000 (S3AC01)
2. Cyanogen chloride	506-77-4	2851 0090 (S3AT01)
3. Hydrogen cyanide	74-90-8	2811 1990 (S3AT02)
4. Chloropicrin: Trichloronitromethane	76-06-2	2904 9000 (S3AC02)
Schedule 3B		
5. Phosphorus oxychloride	10025-87-3	2812 1000 (S3BN01)
6. Phosphorus trichloride	7719-12-2	2812 1000 (S3BN02)
7. Phosphorus pentachloride	10026-13-8	2812 1000 (S3BN03)
8. Trimethyl phosphite	121-45-9	2920 9090 (S3BN04)
9. Triethyl phosphite	122-52-1	2920 9090 (S3BN05)
10. Dimethyl phosphite	868-85-9	2920 9090 (S3BN06)
11. Diethyl phosphite	762-04-9	2920 9090 (S3BN07)
12. Sulfur monochloride	10025-67-9	2812 1000 (S3BB01)
13. Sulfur dichloride	10545-99-0	2812 1000 (S3BB02)
14. Thionyl chloride	7719-09-7	2812 1000 (S3BB03)
15. Ethyldiethanolamine	139-87-7	2922 1990 (S3BB04)
16. Methyl-diethanolamine	105-59-9	2922 1990 (S3BB05)
17. Triethanolamine	102-71-6	2922 1300 (S3BB06)

- A total of 17 chemicals
- Type of chemicals: Old Chemical Warfare agents & other chemical weapons precursors
- Have large number of commercial applications

Some possible product categories that may use Schedule 3 Chemicals:

- Resin and plastic production
 - polycarbonates
 - polyester carbonates
 - polyurethanes
 - polymethylmetacrylate
 - polysulfides
- Isocyanates
- Toiletries
- Pharmaceuticals
- Pesticides
- Herbicides
- Insecticides
- Amine manufacture
- Acrylonitrile manufacture
- Cyanic acid manufacture
- Cyanogen manufacture
- Cyanogen chloride manufacture
- Gold and other noble metal extraction solutions
- Metal plating preparations
- Soil fumigants
- Organic phosphate esters (hydraulic fluids, flame retardants, surfactants, sequestering agents)
- Organic phosphates (stabilizers, antioxidants, flame retardants, lubricants, plasticizers)
- Vulcanising agents for rubber
- Batteries
- Leather tannery and finishing supplies
- Surfactants for detergents, oil drilling emulsions, cutting oils, soaps and toiletries
- Corrosion inhibitors
- Cement manufacture supplies