

Material Safety Data Sheet

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Version 1.6

According to 91/155/EEC

1 - Product and Company Information

Product Name	TETRACHLOROETHYLENE, STANDARD FOR GC
Product Number	02666
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
TETRACHLOROETHYLENE	127-18-4	204-825-9	602-028-00-4

Formula	C2Cl4
Molecular Weight	165.83 AMU
Synonyms	Ankilostin * Antisol 1 * Carbon bichloride * Carbon dichloride * Czterochloroetylen (Polish) * Didakene * Dilatin PT * Dow-per * ENT 1,860 * Ethene, tetrachloro- * Ethylene tetrachloride * Fedal-UN * NCI-C04580 * PER * Perawin * Perchloorethylen, per (Dutch) * Perchlor * Perchloraethylen, per (German) * Perchlorethylene * Perchloroethylene (ACGIH:OSHA) * Perclene * Perclene D * Perchloroetilen (Italian) * Percosolve * PERK * Perklone * Persec * RCRA waste number U210 * Tetlen * Tetracap * Tetrachlooretheen (Dutch) * Tetrachloraethen (German) * Tetrachlorethylene * Tetrachloroethene * Tetrachloroethylene (IUPAC) * 1,1,2,2-Tetrachloroethylene * Tetrachloroethylene (DOT:OSHA) * Tetracloroetene (Italian) * Tetraleno * Tetralex * Tetravec * Tetroguer * Tetropil

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Limited evidence of a carcinogenic effect. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Carc. Cat.3

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

AFTER SKIN CONTACT

In case of contact, immediately wash skin with soap and copious amounts of water.

AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves. Wear disposable coveralls and discard them after use.

METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	60 MG/M3
Poland		NDSch	480 MG/M3
Poland		NDSP	-

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	70 mg/m3
		10 ppm

Remarks: HK

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	345 mg/m3
		50 ppm

Remarks: 4

Remarks: Y

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	40 mg/m3
		6 ppm

Remarks: HKR

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level)	70 mg/m3
		10 ppm

Remarks: K

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	345 mg/m3
		50 ppm

Remarks: H D M

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	345 mg/m3
		50 ppm
OEL	STEL	689 mg/m3
		100 ppm

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator in nonventilated areas and/or for exposure above the TLV or PEL.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Physical State: Clear liquid
	Color: Colorless

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	120 - 122 °C	
MP/MP Range	-22 °C	
Flash Point	N/A	
Flammability	N/A	
Autoignition Temp	N/A	

Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	13 mmHg	20 °C
SG/Density	1.622 g/cm3	
Partition Coefficient	N/A Log Kow: 3.4	
Viscosity	N/A	
Vapor Density	5.83 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents, Strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Hydrogen chloride gas.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: KX3850000

ACUTE TOXICITY

LD50

Oral

Rat

2629 mg/kg

LC50

Inhalation

Rat

34,200 mg/m3

8H

LD50

Intraperitoneal

Rat

4678 MG/KG

LD50

Oral

Mouse

8100 mg/kg

Remarks: Behavioral:General anesthetic.

LC50

Inhalation

Mouse
5,200 ppm
4H

LD50
Subcutaneous
Mouse
65 GM/KG
Remarks: Behavioral:Sleep. Behavioral:Ataxia.

LD50
Intraperitoneal
Dog
2100 MG/KG
Remarks: Liver:Liver function tests impaired.

IRRITATION DATA

Skin
Rabbit
810 mg
24H
Remarks: Severe irritation effect

Skin
Rabbit
500 mg
24H
Remarks: Mild irritation effect

Eyes
Rabbit
162 mg
Remarks: Mild irritation effect

Eyes
Rabbit
500 mg
24H
Remarks: Mild irritation effect

SIGNS AND SYMPTOMS OF EXPOSURE

Exposure can cause: Narcotic effect. Damage to the liver. Damage to the kidneys.

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes eye irritation.
Inhalation: May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.
Ingestion: May be harmful if swallowed.

TARGET ORGAN INFORMATION

Nerves. Heart. Liver. Kidneys.

CHRONIC EXPOSURE - CARCINOGEN

Result: This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Rat

Route of Application: Inhalation
Exposure Time: 6H/2Y
Result: Tumorigenic: Carcinogenic by RTECS criteria.
Blood: Leukemia Tumorigenic Effects: Testicular tumors.

Mouse
Route of Application: Oral
Exposure Time: 50W
Result: Tumorigenic: Carcinogenic by RTECS criteria. Liver: Tumors.

Mouse
Route of Application: Inhalation
Exposure Time: 6H/2Y
Result: Tumorigenic: Carcinogenic by RTECS criteria. Liver: Tumors.

Mouse
Route of Application: Oral
Exposure Time: 62W
Result: Tumorigenic: Carcinogenic by RTECS criteria. Liver: Tumors.

Rat
Route of Application: Inhalation
Exposure Time: 6H/2Y
Result: Tumorigenic: Neoplastic by RTECS criteria. Kidney,
Ureter, Bladder: Kidney tumors. Blood: Leukemia

Mouse
Route of Application: Inhalation
Exposure Time: 6H/2Y
Result: Tumorigenic: Neoplastic by RTECS criteria. Liver: Tumors.

IARC CARCINOGEN LIST

Rating: Group 2A

CHRONIC EXPOSURE - MUTAGEN

Human
100 MG/L
Cell Type: lung
Unscheduled DNA synthesis

Rat
97 UMOL/L
Cell Type: Embryo
Morphological transformation.

Rat
500 PPM
Inhalation
Cytogenetic analysis

Mouse
4 MMOL/KG
Intraperitoneal
DNA damage

Mouse
1 GM/KG
Oral
Other mutation test systems

Mouse
100 PPM
Cell Type: S. typhimurium
Host-mediated assay

Mouse
500 PPM
Inhalation
sperm

Hamster
190 UMOL/L
Cell Type: lung
SLN

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 1000 PPM/24H
Route of Application: Inhalation
Exposure Time: (14D PRE/1-22D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat
Dose: 1000 PPM/24H
Route of Application: Inhalation
Exposure Time: (1-22D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 300 PPM/7H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Homeostasis

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 900 PPM/7H
Route of Application: Inhalation
Exposure Time: (7-13D PREG)
Result: Effects on Newborn: Live birth index (# fetuses per litter; measured after birth). Effects on Newborn: Biochemical and metabolic. Effects on Newborn: Behavioral.

Species: Rat
Dose: 300 PPM/7H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 1000 PPM/6H
Route of Application: Inhalation
Exposure Time: (MULTIGENERATION)
Result: Effects on Newborn: Live birth index (# fetuses per

litter; measured after birth). Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive). Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Species: Mouse

Dose: 500 PPM/7H

Route of Application: Inhalation

Exposure Time: (5D MALE)

Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

CMR CAT.: Carc. Cat.3

12 - Ecological Information

No data available.

ECOTOXICOLOGICAL EFFECTS

Test Type: LC50 Fish

Species: *Cyprinodon variegatus* (Sheepshead minnow)

Time: 96 h

Value: 9.8 mg/l

Test Type: EC50 Daphnia

Species: *Daphnia magna*

Time: 48 h

Value: 7.5 mg/l

Test Type: LC50 Fish

Species: *Lepomis macrochirus* (Bluegill)

Time: 96 h

Value: 13 mg/l

Test Type: LC50 Fish

Species: *Onchorhynchus mykiss* (Rainbow trout)

Time: 96 h

Value: 4.9 mg/l

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 1897

Class: 6.1

PG: III

Proper Shipping Name: Tetrachloroethylene

IMDG

UN#: 1897

Class: 6.1

PG: III

Proper Shipping Name: Tetrachloroethylene

Marine Pollutant: Yes

Severe Marine Pollutant: No

IATA

UN#: 1897

Class: 6.1
PG: III
Proper Shipping Name: Tetrachloroethylene
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 602-028-00-4

INDICATION OF DANGER: Xn N

Harmful. Dangerous for the environment.

R-PHRASES: 40 51/53

Limited evidence of a carcinogenic effect. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-PHRASES: 23 36/37 61

Do not breathe vapor. Wear suitable protective clothing and gloves. Avoid release to the environment. Refer to special instructions/safety data sheets.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 3

SWITZERLAND

SWISS POISON CLASS: 4

NORWAY

Labelling for organic solvents where the package is 1liter or more.

YL-tall m3/l: 12461

YL-group: 5

Risk phrases: 20

Harmful by inhalation.

Safety phrases: 38 42 210

In case of insufficient ventilation, wear suitable respiratory equipment. During fumigation/spraying wear suitable respiratory equipment. Use compressed air- or fresh air line breathing apparatus in confined spaces.

16 - Other Information

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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