

Material Safety Data Sheet

Date Printed: 14/DEC/2004

Date Updated: 12/MAR/2004

Version 1.4

According to 91/155/EEC

1 - Product and Company Information

Product Name	CARBON TETRACHLORIDE, 99.9%
Product Number	319961
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529
Technical Phone #	65 271 1089
Fax	65 271 1571

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
CARBON TETRACHLORIDE	56-23-5	200-262-8	602-008-00-5

Formula	CCl4
Molecular Weight	153.82 AMU
Synonyms	Benzinoform * Carbona * Carbon chloride (CCl4) * Carbon TET * Carbon tetrachloride (ACGIH:OSHA) * Chlorid uhlicity (Czech) * Czterochlorek wegla (Polish) * ENT 4,705 * ENT 27164 * Flukoids * Halon 1040 * Methane tetrachloride * Methane, tetrachloro- * Necatorina * Perchloromethane * R 10 * RCRA waste number U211 * R 10 (Refrigerant) * Tetrachloorkoolstof (Dutch) * Tetrachloormetaan * Tetrachlorkohlenstoff, tetra (German) * Tetrachlormethan (German) * Tetrachlorocarbon * Tetrachloromethane (OSHA) * Tetrachlorure de carbone (French) * Tetraclorometano (Italian) * Tetracloruro di carbonio (Italian) * Tetrafinol * Tetraform * Tetrasol * Univerm * Vermoestricid

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Toxic by inhalation, in contact with skin and if swallowed.

Limited evidence of a carcinogenic effect. Toxic: danger of
serious damage to health by prolonged exposure through inhalation.
Harmful to aquatic organisms, may cause long-term adverse effects
in the aquatic environment. Dangerous for the ozone layer.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	20 MG/M3

Poland	NDSCh	100 MG/M3
Poland	NDSP	-
EXPOSURE LIMITS - DENMARK		
Source	Type	Value
OEL	TWA	6.3 mg/m3
		1 ppm
Remarks: HK		
EXPOSURE LIMITS - GERMANY		
Source	Type	Value
TRGS 900	OEL	65 mg/m3
		10 ppm
Remarks: 4		
Remarks: H		
EXPOSURE LIMITS - NORWAY		
Source	Type	Value
	OEL	13 mg/m3
		2 ppm
Remarks: HK		
EXPOSURE LIMITS - SWEDEN		
Source	Type	Value
	LLV (Level	13 mg/m3
		2 ppm
Remarks: H, K		
EXPOSURE LIMITS - SWITZERLAND		
Source	Type	Value
OEL	OEL	30 mg/m3
		5 ppm
Remarks: H D M		
EXPOSURE LIMITS - UNITED KINGDOM		
Source	Type	Value
OEL	OEL	13 mg/m3
		2 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: Liquid	
Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	77 °C	
MP/MP Range	-23 °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	143 mmHg	30 °C
SG/Density	1.59 g/cm3	

Partition Coefficient	Log Kow: 2.83
Viscosity	2.03 Pas
Vapor Density	5.32 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	32.3 mN/m
Conductivity	N/A
Miscellaneous Data	N/A
Solubility	Other Solvents: SOLUBLE IN ETHANOL, ACETONE, NAPHTHA MISCIBLE WITH: ALCOHOL, BENZENE, CHLOROFORM, E

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Phosgene gas, Hydrochloric acid.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: FG4900000

ACUTE TOXICITY

LDLO

Oral

Man

429 mg/kg

Remarks: Cardiac: Change in rate. Lungs, Thorax, or
Respiration: Cyanosis. Kidney, Ureter, Bladder: Interstitial
nephritis.

LCLO

Inhalation

Human

1,000 ppm

LCLO

Inhalation

Human

5 PPH/5M

LD50

Oral

Rat

2350 mg/kg

LC50

Inhalation

Rat

8,000 ppm

4H

LD50
Skin
Rat
5070 mg/kg

LD50
Intraperitoneal
Rat
1500 UL/KG

LD50
Oral
Mouse
8263 mg/kg

LC50
Inhalation
Mouse
9,526 ppm
8H

LD50
Intraperitoneal
Mouse
572 MG/KG

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

LD50
Intraperitoneal
Dog
1500 MG/KG
Remarks: Liver:Liver function tests impaired.

LD50
Oral
Rabbit
5760 mg/kg

LD50
Skin
Rabbit
> 20000 mg/kg

LD50
Intravenous
Rabbit
5840 MG/KG
Remarks: Behavioral:Excitement. Behavioral:Coma. Lungs, Thorax,
or Respiration:Dyspnea.

LD50
Oral
Guinea pig
5760 mg/kg

LD50
Skin
Guinea pig
>9400 UL/KG

LD50
Intraperitoneal
Chicken
4497 MG/KG
Remarks: Gastrointestinal:Ulceration or bleeding from small intestine. Gastrointestinal:Other changes.

LD50
Oral
Mammal
6000 mg/kg

LC50
Inhalation
Mammal
34,500 mg/m3

IRRITATION DATA

Skin
Human
Remarks: If not removed promptly, local application of Carbon Tetrachloride to human skin produces distinct pain with erythema, hyperemia and wheal formation followed by vesication.

Skin
Rabbit
4 mg
Remarks: Mild irritation effect

Skin
Rabbit
500 mg
24H
Remarks: Mild irritation effect

Eyes
Rabbit
2.2 mg
30S
Remarks: Mild irritation effect

Eyes
Rabbit
500 mg
24H
Remarks: Mild irritation effect

SIGNS AND SYMPTOMS OF EXPOSURE

Exposure can cause: Stomach pains, vomiting, diarrhea. Nausea, dizziness, and headache. Damage to the eyes. Damage to the liver. Damage to the kidneys. Exposure to and/or consumption of alcohol may increase toxic effects.

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.
Skin Absorption: Toxic if absorbed through skin. Readily absorbed through skin.

Eye Contact: May cause eye irritation.
Inhalation: Toxic if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.
Ingestion: Toxic if swallowed.

TARGET ORGAN INFORMATION

Liver. Kidneys. Eyes. Nerves. Heart.

CHRONIC EXPOSURE - CARCINOGEN

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

Rat

Route of Application: Subcutaneous

Exposure Time: 12W

Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Liver:Tumors.

Mouse

Route of Application: Oral

Exposure Time: 19W

Result: Tumorigenic:Neoplastic by RTECS criteria. Liver:Tumors. Skin and Appendages: Other: Tumors.

Mouse

Route of Application: Parenteral

Exposure Time: 30W

Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Liver:Tumors.

Hamster

Route of Application: Oral

Exposure Time: 30W

Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Liver:Hepatitis, fibrous (cirrhosis, post-necrotic scarring). Liver:Tumors.

Mouse

Route of Application: Oral

Exposure Time: 88D

Result: Tumorigenic:Neoplastic by RTECS criteria. Liver:Tumors.

Rat

Route of Application: Subcutaneous

Exposure Time: 25W

Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Liver:Tumors.

Rat

Route of Application: Subcutaneous

Exposure Time: 12W

Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Liver:Tumors.

Rat

Route of Application: Subcutaneous

Exposure Time: 70W

Result: Tumorigenic:Carcinogenic by RTECS criteria. Liver:Tumors. Endocrine:Thyroid tumors.

Mouse

Route of Application: Oral
Exposure Time: 9W
Result: Tumorigenic:Neoplastic by RTECS criteria. Liver:Tumors.

Mouse
Route of Application: Oral
Exposure Time: 12W
Result: Tumorigenic:Neoplastic by RTECS criteria. Liver:Tumors.

IARC CARCINOGEN LIST

Rating: Group 2B

CHRONIC EXPOSURE - MUTAGEN

Rat
367 UMOL/KG
Intraperitoneal
DNA

Rat
31 GM/KG
Subcutaneous
12W
DNA damage

Rat
3 MMOL/L
Cell Type: liver
DNA damage

Rat
100 MG/KG
Intraperitoneal
Other mutation test systems

Rat
100 MG/KG
Intraperitoneal
Unscheduled DNA synthesis

Rat
1400 MG/KG
Oral
Unscheduled DNA synthesis

Rat
50 MG/KG
Oral
Other mutation test systems

Rat
31 GM/KG
Subcutaneous
12W
Cytogenetic analysis

Mouse
367 UMOL/KG
Intraperitoneal
DNA

Mouse
10 UMOL
Cell Type: liver
DNA

Mouse
335 UMOL/KG
Oral
DNA damage

Mouse
6550 UMOL/L
Cell Type: lymphocyte
DNA damage

Mouse
100 MG/KG
Oral
Unscheduled DNA synthesis

Mouse
2 GM/KG
Oral
DNA inhibition

Hamster
500 UG/L
Cell Type: Embryo
Morphological transformation.

Hamster
1600 UMOL/L
Cell Type: lung
SLN

Mammal
1 MMOL/L
Cell Type: lymphocyte
DNA

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 3 GM/KG
Route of Application: Oral
Exposure Time: (14D PREG)
Result: Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).

Species: Rat
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

Species: Rat
Dose: 2384 MG/KG
Route of Application: Parenteral
Exposure Time: (18D PREG)

Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Hepatobiliary system.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Result: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Species: Rat
Dose: 2 GM/KG
Route of Application: Oral
Exposure Time: (7-8D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 150 MG/KG
Route of Application: Oral
Exposure Time: (8D PREG)
Result: Maternal Effects: Other effects. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 750 MG/KG
Route of Application: Oral
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: 250 PPM/8H
Route of Application: Inhalation
Exposure Time: (10-15D PREG)
Result: Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive). Effects on Newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4).

Species: Rat
Dose: 71500 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (15D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.
Paternal Effects: Prostate, seminal vessicle, Cowper's gland, accessory glands.

Species: Rat
Dose: 5 GM/KG
Route of Application: Intraperitoneal
Exposure Time: (1D MALE)
Result: Paternal Effects: Other effects on male.

CMR CAT.: Carc. Cat.3

12 - Ecological Information

BIOACCUMULATION POTENTIAL: No indication of bioaccumulation.

ECOTOXICOLOGICAL EFFECTS

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time: 96 h

Value: 42 mg/l

Test Type: EC50 Daphnia

Species: Daphnia magna

Time: 48 h

Value: 530 mg/l

Test Type: LC50 Fish

Species: Lepomis macrochirus (Bluegill)

Time: 96 h

Value: 27 mg/l

Test Type: EC50 Daphnia

Species: Daphnia magna

Time: 48 h

Value: 35 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#: 1846

Class: 6.1

PG: II

Proper Shipping Name: Carbon tetrachloride

IMDG

UN#: 1846

Class: 6.1

PG: II

Proper Shipping Name: Carbon tetrachloride

Marine Pollutant: Yes

Severe Marine Pollutant: No

IATA

UN#: 1846

Class: 6.1

PG: II

Proper Shipping Name: Carbon tetrachloride

Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 602-008-00-5

INDICATION OF DANGER: T N

Toxic. Dangerous for the environment.

R-PHRASES: 23/24/25 40 48/23 52/53 59

Toxic by inhalation, in contact with skin and if swallowed.

Limited evidence of a carcinogenic effect. Toxic: danger of serious damage to health by prolonged exposure through inhalation. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Dangerous for the ozone layer.

S-PHRASES: 23 36/37 45 59 61

Do not breathe vapor. Wear suitable protective clothing and

gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Refer to manufacturer/supplier for information on recovery/recycling. Avoid release to the environment. Refer to special instructions/safety data sheets.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 3

SWITZERLAND

SWISS POISON CLASS: 1*

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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