

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.1
Creation Date: July 15, 2019
Revision Date: April 16, 2024

SECTION 1: Identification

1.1 GHS Product identifier

Product name Terbufos Solution Reference Material in Methanol

1.2 Other means of identification

Product number CPRM5716

Other names Terbufos [ANSI:BSI:ISO]; S-[(tert-butylsulfanyl)methyl] O,O-diethyl phosphorodithioate; O,O-diethyl S-(tert-butylthio)methyl phosphorodithioate

1.3 Recommended use of the chemical and restrictions on use

Identified uses For laboratory and Industrial use only.
Uses advised against no data available

1.4 Supplier's details

Company CATO Research Chemicals Inc.
Address 3/F,Building B,No.179 BASIGO, Guangpu Rd East,Huangpu Dist,Guangzhou
Telephone +86-20-81960175

1.5 Emergency phone number

Emergency phone number +86-20-81960175
Service hours 'Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Acute toxicity - Category 2, Oral
Acute toxicity - Category 1, Dermal
Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H300 Fatal if swallowed
H310 Fatal in contact with skin
H410 Very toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P262 Do not get in eyes, on skin, or on clothing.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P273 Avoid release to the environment.
P301+P316 IF SWALLOWED: Get emergency medical help immediately.
P321 Specific treatment (see ... on this label).
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P316 Get emergency medical help immediately.
P361+P364 Take off immediately all contaminated clothing and wash it before reuse.
P391 Collect spillage.

Storage

P405 Store locked up.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Terbufos Solution Reference Material in Methanol	S-tert-butylthiomethyl O,O-diethylphosphorodithioate	13071-79-9	235-963-8	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer immediately for medical attention.

Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer immediately for medical attention.

Following eye contact

Rinse with plenty of water (remove contact lenses if easily possible). Refer for medical attention.

Following ingestion

Rinse mouth. Refer immediately for medical attention. Give a slurry of activated charcoal in water to drink.

4.2 Most important symptoms/effects, acute and delayed

This material may be fatal if swallowed, inhaled, or absorbed through the skin. Repeated inhalation or skin contact may progressively increase susceptibility to poisoning. (EPA, 1998)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Airway protection. Ensure that a clear airway exists. Intubate the patients and aspirate the secretions with a large-bore suction device if necessary. Administer oxygen by mechanically assisted pulmonary ventilation if respiration is depressed. Improve tissue oxygenation as much as possible before administering atropine, so as to minimize the risk of ventricular fibrillation. In severe poisonings, it may be necessary to support pulmonary ventilation mechanically for several days. Organophosphorus pesticides

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

If material on fire or involved in fire: Do not extinguish fire unless flow can be stopped. Use water in flooding quantities as fog. Solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible. Use "alcohol" foam, dry chemical or carbon dioxide. Organophosphorus pesticides, liquid, flammable, toxic; Organophosphorus pesticides, liquid, toxic

5.2 Specific hazards arising from the chemical

This is a liquid organophosphorus pesticide. Fire may produce irritating or poisonous gases. Hydrolyzes under alkaline conditions. (EPA, 1998)

5.3 Special protective actions for fire-fighters

In case of fire in the surroundings: all extinguishing agents allowed.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Collect leaking liquid in covered containers. Then store and dispose of according to local regulations.

6.2 Environmental precautions

Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Collect leaking liquid in covered containers. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Environmental considerations: Air spill: Apply water spray or mist to knock down vapors. Organophosphorus pesticides, liquid, flammable, toxic; Organophosphorus pesticides, liquid, toxic; Organophosphorus pesticides, solid, toxic

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Separated from food and feedstuffs and oxidizing materials. Store in an area without drain or sewer access. Provision to contain effluent from fire extinguishing. You should store this chemical in a freezer and away from all mineral acids and bases.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 0.01 mg/m³, as TWA; (skin); A4 (not classifiable as a human carcinogen); BEI issued

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear face shield.

Skin protection

Protective clothing. Protective gloves.

Respiratory protection

Avoid inhalation of aerosol.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Technical product is a clear, colorless to pale yellow liquid. Used as a soil insecticide. (EPA, 1998)
Colour	Slightly yellowish liquid
Odour	Mercaptan-like odor
Melting point/freezing point	-29°C
Boiling point or initial boiling point and boiling range	69°C (0.01 mmHg)
Flammability	Combustible.
Lower and upper explosion limit/flammability limit	no data available
Flash point	88°C
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	Insoluble (<1 mg/ml) (NTP, 1992)
Partition coefficient n-octanol/water	log Kow = 4.48
Vapour pressure	0.000628mmHg at 25°C
Density and/or relative density	1.105
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on heating and on burning. This produces highly flammable and toxic gases (phosphine see ICSC 0694). Reacts with oxidizing substances. This produces toxic fumes including phosphorous oxides.

10.2 Chemical stability

Stable for at least two years at room temperature.

10.3 Possibility of hazardous reactions

Moderate fire risk.Organothiophosphates, such as TERBUFOS, are susceptible to formation of highly toxic and flammable phosphine gas in the presence of strong reducing agents such as hydrides. Partial oxidation by oxidizing agents may result in the release of toxic phosphorus oxides. This compound decomposes in the presence of acids or bases (NTP, 1992).

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

no data available

10.6 Hazardous decomposition products

This compound decomposes in the presence of acids or bases /and/... at temperatures over 120 deg C.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Rat male oral 2 mg/kg from table
- Inhalation: no data available
- Dermal: LD50 Rat percutaneous 9.8 mg/kg

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Cancer Classification: Group E Evidence of Non-carcinogenicity for Humans

Reproductive toxicity

no data available

STOT-single exposure

Cholinesterase inhibition. The substance may cause effects on nervous system. This may result in central nervous system disorders.

STOT-repeated exposure

The substance may have effects on the nervous system.

Aspiration hazard

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly on spraying.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 *Lepomis macrochirus* (bluegill sunfish) 0.004 mg/l/96 hr /Conditions of bioassay not specified
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

Soils from two sites in MO planted with corn and treated at different times with terbufos and other pesticides were examined for microbial populations and efficacy of residual insecticide treatment on ten day old house crickets, *Acheta domesticus*. ... Soil bacteria counts correlated well ... with the biological persistence of the cricket bioassay. ... Actinomycetes dominated the relationships of various degradation bioassay curves.

12.3 Bioaccumulative potential

An estimated BCF of 560 was calculated for terbufos(SRC), using a log Kow of 4.48(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is high(SRC).

12.4 Mobility in soil

Koc values ranging from 500 to 5000 have been reported for terbufos(1-4). According to a classification scheme(5), these Koc values suggest that terbufos is expected to have low to slight mobility in soil.

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN2783 (For reference only, please check.) IMDG: UN2783 (For reference only, please check.) IATA: UN2783 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC (For reference only, please check.) IMDG: ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC (For reference only, please check.) IATA: ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.) IMDG: 6.1 (For reference only, please check.) IATA: 6.1 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: I (For reference only, please check.) IMDG: I (For reference only, please check.) IATA: I (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: Yes IMDG: Yes IATA: Yes

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
S-tert-butylthiomethyl O,O-diethylphosphorodithioate	S-tert-butylthiomethyl O,O-diethylphosphorodithioate	13071-79-9	235-963-8
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Not Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Not Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.
Korea Existing Chemicals List (KECL)			Listed.

SECTION 16: Other information

Information on revision

Creation Date July 15, 2019
Revision Date April 16, 2024

Abbreviations and acronyms



- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

Depending on the degree of exposure, periodic medical examination is suggested. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available. If the substance is formulated with solvents also consult the ICSCs of these materials. Carrier solvents used in commercial formulations may change physical and toxicological properties. Do NOT take working clothes home.

Any questions regarding this SDS, Please send your inquiry to info@cato-chem.com

Disclaimer: 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. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.