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SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.2
Creation Date: July 15, 2019
Revision Date: August 08, 2025

SECTION 1: Identification

1.1 GHS Product identifier

Product name Malathion

1.2 Other means of identification

Product number CCPD100552
Other names mercaptothion; carbophos; rac-diethyl (2R)-2-[(dimethoxyphosphorothioyl)sulfanyl]butanedioate

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 4, Oral
Skin sensitization, Category 1
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 Warning
Hazard statement(s)
H302 Harmful if swallowed
H317 May cause an allergic skin reaction
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.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P273 Avoid release to the environment.
Response
P301+P317 IF SWALLOWED: Get medical help.
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P333+P317 If skin irritation or rash occurs: Get medical help.
P321 Specific treatment (see ... on this label).
P362+P364 Take off contaminated clothing and wash it before reuse.
P391 Collect spillage.
Storage none

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
Malathion	Malathion	121-75-5	204-497-7	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Half-upright position. Refer for medical attention.

Following skin contact

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

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

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

4.2 Most important symptoms/effects, acute and delayed

Exposure to fumes from a fire or to liquid causes headache, blurred vision, constricted pupils of the eyes, weakness, nausea, cramps, diarrhea, and tightness in the chest. Muscles twitch and convulsions may follow. The symptoms may develop over a period of 8 hours. (USCG, 1999)

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

If this chemical gets into the eyes, remove any contact lenses at once and irrigate immediately for at least 15 min, occasionally lifting upper and lower lids. Seek medical attention immediately. If this chemical contacts the skin, remove contaminated clothing and wash immediately with soap and water. Speed in removing material from skin is of extreme importance. Shampoo hair promptly if contaminated. Seek medical attention immediately. If this chemical has been inhaled, remove from exposure, begin rescue breathing (using universal precautions, including resuscitation mask) if breathing has stopped and CPR if heart action has stopped. Transfer promptly to a medical facility.

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Vapors and fumes from fires are hazardous. They include sulfur dioxide and phosphoric acid. Behavior in Fire: Gives off hazardous fumes. Area surrounding fire should be diked to prevent water runoff. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Use foam. Use powder. Use carbon dioxide.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in sealable containers as far as possible. See Chemical Dangers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.2 Environmental precautions

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in sealable containers as far as possible. See Chemical Dangers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

ACCIDENTAL RELEASE MEASURES: Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided. Methods and materials for containment and cleaning up: Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

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

Store in an area without drain or sewer access. Separated from strong oxidants and food and feedstuffs. Keep in a well-ventilated room.Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Recommended storage temperature 2 - 8 deg C

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 1 mg/m3, as TWA; (skin); A4 (not classifiable as a human carcinogen); BEI issued.MAK: (inhalable fraction): 15 mg/m3; peak limitation category: II(4); pregnancy risk group: D

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 safety goggles or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Malathion is a yellow to dark-brown liquid with a skunk-like odor. Sinks in water. Freezing point is 37°F. (USCG, 1999)
Colour	Colorless or slightly yellow
Odour	Skunk-like odor
Melting point/freezing point	2.85°C
Boiling point or initial boiling point and boiling range	156°C
Flammability	Class IIIB Combustible Liquid: Fl.P. at or above 200°F., but may be difficult to ignite.
Lower and upper explosion limit/flammability limit	no data available
Flash point	186.7°C
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	less than 1 mg/mL at 70.7° F (NTP, 1992)
Partition coefficient n-octanol/water	2.89
Vapour pressure	3.9E-06mmHg at 25°C
Density and/or relative density	1.2076
Relative vapour density	(air = 1): 11.4
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on heating and on burning. This produces toxic fumes including phosphorus oxides and sulfur oxides. Reacts violently with strong oxidants. Attacks iron, some other metals, some forms of plastic and rubber. Decomposes on heating. This produces the more toxic

isomalathion.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Malathion is combustible but ignites with difficulty.MALATHION is a yellow to brown liquid that solidifies at 2.9° C, moderately toxic. Organic phosphate insecticide, acts as an inhibitor of cholinesterase. When heated to decomposition it emits toxic fumes of oxides of sulfur and phosphorus [Lewis, 3rd ed., 1993, p. 789].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Incompatible materials: Strong oxidizing agents. Corrodes metal.

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions - Carbon oxides, sulfur oxides, oxides of phosphorus

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Mouse oral 1025 mg/kg
- Inhalation: LC50 Rat inhalation 43,790 ug/cu m/4 hr
- Dermal: no data available

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: Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential

Reproductive toxicity

no data available

STOT-single exposure

The substance may cause effects on the central nervous system. This may result in convulsions and respiratory depression. The effects may be delayed. Medical observation is indicated.

STOT-repeated exposure

Repeated or prolonged contact may cause skin sensitization. Cholinesterase inhibition. Cumulative effects are possible. See Acute Hazards/Symptoms.

Aspiration hazard

A harmful contamination of the air will not or will only very slowly be reached on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50; Species: Salmo trutta (Brown trout) weight 1.1 g; Conditions: static bioassay, 12 deg C; Concentration: 101 ug/L for 96 hr (95% confidence limit: 84-115 ug/L) /Technical, 95%
- Toxicity to daphnia and other aquatic invertebrates: LC50; Species: Daphnia magna (Water Flea) neonate; Conditions: freshwater, static; Concentration: 16.81 ug/L for 24 hr />95% purity
- Toxicity to algae: EC50; Species: Pseudokirchneriella subcapitata (Green Algae) initial cell density was 15,000; Conditions: freshwater, static, 24 deg C, pH 7.5, dissolved oxygen 1 to 3 mg/L; Concentration: 2320 ug/L for 48 hr; Effect: growth, cell density
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: Malathion, present at 100 mg/L, reached 22% of its Theoretical BOD in 4 weeks using an activated sludge inoculum at 30 mg/L in the Japanese MITI test(1). Malathion is rapidly degraded in soils with reported degradation in 10 days in various non sterile (sterile) loam soils: 92% (8%), 94% (5%), and 81% (19%)(2). Biochemical reactions utilized include desulfuration, oxidation, hydrolysis,

transfer of alkyl or aryl groups, alkylation, dealkylation, reduction and conjugation(2). The rate of degradation increased with increasing soil organic matter and was related to soil pH(3). C14-Malathion was biodegraded 50% and 10% after 17 days in clay loam (45.3% sand, 19.7% silt, 35% clay, 5.74% organic matter) and sandy soil (74.74% sand, 24.76% silt, 0.5% clay, 1.9% organic matter), respectively(4). In activated sludge, malathion had a first-order degradation rate of 0.161/hr(8). In raw river water (pH 7.3-8.0), malathion was degraded 90% within 2 weeks, no change was observed in distilled water over 3 weeks suggesting that degradation was biological(5). Degradation of malathion was complete in 3 days in non-sterile estuarine sediments, and 57% in 11 days in sterilized sediment(6). Malathion has a first-order degradation rate of 0.902/day and a half-life of 0.8 days under aerobic conditions, under anaerobic conditions a first-order degradation rate of 0.302/day and a half-life of 2.3 days were reported in sediment from San Diego Creek, CA(7). Products of degradation include alpha and beta monocarboxylic acids (major metabolite in soil), and dicarboxylic acid(9).

12.3 Bioaccumulative potential

Malathion did not bioconcentrate in the freshwater fish topmouth gudgeon (Pseudorasbora parva)(1). No detectable concentration of malathion was observed in pinfish (Lagodon sp) after exposure to 20-75 ug/L(2). Malathion undergoes biotransformation in fish with some of the metabolites being malaoxon, malathion monoacid, malathion diacid, O,O-dimethyl phosphorodithioate, O,O-dimethyl phosphorodithiolate, O,O-dimethyl phosphorodithionate and O,O-dimethylphosphate(2). Based on the rapid metabolism, bioconcentration of malathion in aquatic organisms is expected to be low(SRC). The BCF for egg masses of the Triaenodes tardus (caddisfly) was found to be 10(3). Malathion had BCFs of 3.0, 23 and 1.2 in axenically cultured parrot feather (Myriophyllum aquaticum), duckweed (Spirodela oligorrhiza L) and elodea (Elodea canadensis), respectively(4).

12.4 Mobility in soil

The Koc of malathion was determined 26 times in a field study conducted with five applications at a 10 day interval in a lychee orchard in northern Thailand; Koc values were reported as 927-17,620(1). Other reported Koc values of malathion in soil are 1175(2), 1200(3) and 1800(4). According to a classification scheme(5), these Koc values suggest that malathion is expected to have low to no mobility in soil(SRC). An experiment conducted to see how much malathion leaches at depths of 50 cm in soil found that most of the malathion is degraded in the higher layers of soil (within the polar carboxylic acid groups) and only small degradation products, that are usually biodegradable, move to the groundwater(6).

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: UN3082 (For reference only, please check.) IMDG: UN3082 (For reference only, please check.) IATA: UN3082 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (For reference only, please check.) IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (For reference only, please check.) IATA: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 9 (For reference only, please check.) IMDG: 9 (For reference only, please check.) IATA: 9 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: III (For reference only, please check.) IMDG: III (For reference only, please check.) IATA: III (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
Malathion	Malathion	121-75-5	204-497-7
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)			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 August 08, 2025

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.

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