

MATERIAL SAFETY DATA SHEET

Manufacturer/information service:

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1. Chemical Product Identification

Product Name: Malathion 50%EC

Molecular Formula: $C_{10}H_{19}O_6PS_2$

Chemical Name: diethyl (dimethoxy thiophosphorylthio) succinate

Molecular Weight: 330.3

CAS No.: 121-75-5

Form: oily liquid

Color: Clear, amber

Odor: with a weak ester odor;

UN No.: 2783

2. Composition / Information On Ingredients

HAZARDOUS INGREDIENTS HAZARDOUS INGREDIENTS	WEIGHT %	CAS REG #	LD50 (mg/Kg)	T.W.A. - T.L.V.
Malathion Petroleum Distillates Calculate LD50 for mixture	50 40 - 50	121-75-5 64742-94-5	Oral, rat 1375 Dermal, rat 2000 Oral >10 mL/Kg 2750	LC50 5.2 mg/L >3800 mg/m ³ /4h

3. Hazards Identification

Component Symbol R phrases

Malathion Xn 22

More important danger for the man: None

Dangers for the environment: The substance is very toxic to aquatic organisms. This substance may be hazardous to the environment; special attention should be given to honey bees. Avoid release to the environment in circumstances different to normal use.

Physical-chemical dangers: The substance decomposes on heating or on burning producing toxic fumes including phosphorous oxides and sulfur oxides. Reacts violently with strong oxidants. Attacks iron and some other metals, some plastics and rubber.

4. First Aid Measures

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

Eyes: First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.

Inhalation: Move affected person to fresh air and keep at rest until recovered. If

not breathing, give artificial respiration and get to a doctor.

Ingestion: Do not induce vomiting if the person is conscious. Give glass of water. Get to a doctor.

Notes to physician: Antidote: Atropine, PAM, 2-PAMCl, 2-PAMM.

5. Fire-Fighting Measures

Extinguishing media

To be used: Carbon dioxide, foam, powder

Don't use: Not applicable

Particular risk: None

Measures of personal protection: Safety glasses or goggles, rubber gloves, shoes plus socks, long-sleeved shirt, and long pants.

6. Accidental Release Measures

Personal cautions: Safety glasses or goggles, rubber gloves, shoes plus socks, long-sleeved shirt, and long pants.

Cleaning methods

EX: The empty container may be decontaminated by rinsing two or three times with water and detergent and scrubbing the sides.

Environmental cautions

EX: Prevent the contamination of the floor and the beds of water.

7. Handling And Storage

Store in cool, dry, well-ventilated, secure area out of reach of children and animals. Harmful if swallowed or inhaled. Avoid contact with skin. Wash thoroughly after handling. Change contaminated clothing. Do not contaminate food or feed products. Biological activity of malathion premium grade remains practically unvaried for 2 years provided stored in unopened, undamaged original containers, in cool, shaded, well ventilated places.

Recommended 68-86°F (20-25°C) for good shelflife. Do not heat above 55°C. Above 100°C, decomposes rapidly and explosion may be induced.

8. Exposure Controls / Personal Protection

Personal protective equipment

Respiratory protection: Approved respirator

Protective gloves: Rubber gloves

Eye protection: Safety goggles or face shield.

Industrial hygiene: adequate ventilation.

9. Physical And Chemical Properties

Appearance: Clear, amber oily liquid with a weak ester odor;;

Melting point: 2.85°C;

Boiling point: 155~157°C/93.3Pa;

Density: 1.23 (25°C);

Water solubility: 145 mg/l (25°C);

Other solubility: Miscible with most organic solvents, e.g. alcohols, esters, ketones, ethers, aromatic hydrocarbons. Slightly soluble in petroleum ether and some types of mineral oil;

Vapor Pressure: 5.3 mPa @ 30 °C

Partition Coefficient: 2.7482

Adsorption Coefficient: 1800

10. Stability And Reactivity

Conditions to avoid: high temperature, flame, fire, and moist condition.

Products to avoid: Acidic and alkaline media;

Thermal decomposition: N/A;

Hazardous decomposition products: Thermal decomposition (e.g. fire) may produce dimethyl sulfide, sulfur dioxide, carbon monoxide, carbon dioxide, phosphorus pentoxide, nitrogen oxides.

Hazardous reaction: N/A;

11.Toxicological Information

Acute oral LD50: rat 1375-2800mg/kg

Acute dermal LD50: rabbit 4100mg/kg

Contact with the skin: (Further see Inhalation).

Contact with the eyes: Not irritant to eye.

Ingestion: Abdominal cramps. Diarrhoea. Nausea. Vomiting. (Further see Inhalation).

Reproductive effects: Several studies have documented developmental and reproductive effects due to high doses of malathion in test animals. Rats fed high doses of 240 mg/kg/day during pregnancy showed an increased rate of newborn mortality. However, malathion fed to rats at low dosages caused no reproductive effects. It is not likely that malathion will cause reproductive effects in humans under normal circumstances.

Teratogenic effects: Rats fed high doses (240 mg/kg/day) showed no teratogenic effects. Malathion and its metabolites can cross the placenta of the goat and depress cholinesterase activity of the fetus. Chickens fed diets at low doses for 2 years showed no adverse effects on egg hatching. Current evidence indicates that malathion is not teratogenic.

Mutagenic effects: Malathion produced detectable mutations in three different types of cultured human cells, including white blood cells and lymph cells. It is not clear what the implications of these results are for humans.

Carcinogenic effects: Female rats on dietary doses of approximately 500 mg/kg/day of malathion for 2 years did not develop tumors. Adrenal tumors developed in the males at low doses, but not at the high doses, suggesting that malathion was not the cause. Three of five studies that have investigated the carcinogenicity of malathion have found that the compound does not produce tumors in the test animals. The two other studies have been determined to be unacceptable studies and the results discounted. Available evidence suggests that malathion is not carcinogenic but the data are not conclusive.

Organ toxicity: The pesticide has been shown in animal testing and from use experience to affect the central nervous system, immune system, adrenal glands, liver, and blood.

12.Ecological And Ecotoxicological Information

Effects on birds: Malathion is moderately toxic to birds. The reported acute oral LD50 values are: in mallards, 1485 mg/kg; in pheasants, 167 mg/kg; in blackbirds and starlings, over 100 mg/kg; and in chickens, 525 mg/kg. The reported 5- to 8-day dietary LC50 is over 3000 ppm in Japanese quail, mallard, and northern bobwhite, and is 2639 ppm in ring-neck pheasants. Furthermore, 90% of the dose to birds was metabolized and excreted in 24 hours via urine.

Effects on aquatic organisms: Malathion has a wide range of toxicities in fish, extending from very highly toxic in the walleye (96-hour LC50 of 0.06 mg/L)

to highly toxic in brown trout (0.1 mg/L) and the cutthroat trout (0.28 mg/L), moderately toxic in fathead minnows (8.6 mg/L) and slightly toxic in goldfish (10.7 mg/L). Various aquatic invertebrates are extremely sensitive, with EC50 values from 1 ug/L to 1 mg/L. Malathion is highly toxic to aquatic invertebrates and to the aquatic stages of amphibians. Because of its very short half-life, malathion is not expected to bioconcentrate in aquatic organisms. However, brown shrimp showed an average concentration of 869 and 959 times the ambient water concentration in two separate samples. Effects on other organisms: The compound is highly toxic to honeybees.

13. Disposal Considerations

Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other approved state and local procedures.

Collect leaking and spilled liquid in sealable containers as far as possible.

14. Transport Information

Do not transport with food and feedstuffs.

UN No.: 2783;

UN Hazard Class: 9

UN Packing Group: III

15. Regulatory Information

Symbol: Xn;

R phrases: R 22;

S phrases: S2-24/7/9/13/36/37/39

16. Other Information

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the PRODUCT AS SUCH. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons on receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produce formulations containing this product, it is the recipients sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.