

Thiophanate-methyl -MATERIAL SAFETY DATA SHEET

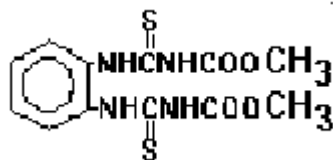
1. Chemical Product Identification

Product Name: Thiophanate-methyl

Molecular Formula: C₁₂H₁₄N₄O₄S₂

Molecular Weight: 342.4

Structural Formula:



Chemical Name: dimethyl 4,4'-(o-phenylene)bis(3-thioallophanate) (IUPAC)

Color: Colorless

Form: Crystalloid

Odor: slight special odor

CAS No.: 23564-05-8

2. Composition / Information on Ingredients

Composition	CAS No.	Content %
Thiophanate-methyl	23564-05-8	97.0
Other ingredients		3.0

3. Hazards Identification

Component	Symbol	R phrases
-----------	--------	-----------

Thiophanate-methyl	Xn, Xi, N	R68-20-43-50/53
--------------------	-----------	-----------------

More important danger for the man: None;

Dangers for the environment: Slight to moderately toxic to fish;

Physical-chemical dangers: Not applicable.

4. First Aid Measures

If poisoning occurs, immediately contact a doctor or Poisons Information Centre, and follow the advice given. Show this Material Safety Data Sheet to a doctor.

Eye: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.

Skin: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

Ingestion: If swallowed, drink 1 or 2 glasses of water (or milk) and induce vomiting by touching the back of the throat with finger. If possible, contact a physician, Poison Control Center, or emergency center before inducing vomiting. Do not induce vomiting or give anything by mouth to an unconscious person. Take person and product container to the nearest emergency treatment center.

Inhalation: If respiratory discomfort or irritation occurs, move the person to fresh air. See a doctor if discomfort or irritation continues. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

Note to physician: No specific antidote. Treat symptomatically.

5. Fire-Fighting Measures

Extinguishing media: Powder, foam, and sand;

Don't use: not applicable;

Particular risk: not applicable;

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: Clean up spill immediately. Absorb spill with inert material (such as dry sand or earth), then place in a chemical waste container. Wash area with soap and water. Pick up wash liquid with additional absorbent and place in a chemical waste container.

Environmental cautions

EX: prevent the contamination of the floor and of beds of water. Isolate contaminated water.

7. Handling and Storage

Handling: Avoid getting in eyes or on skin, or clothing and breathing dust. Remove contaminated clothing immediately. Wash thoroughly after handling.

Storage: Keep in original container. Do not store or transport near food or feed. Do not contaminate food or feed. Do not put concentrate into food or drink containers. Do not dilute concentrate in food or drink containers. Store in a cool, dry place, out of direct sunlight.

Fire and explosion protection: the area must be far from fire and flammable materials.

8. Exposure Controls/Personal Protection

Personal protective equipment

Respiratory protection: approved respirator;

Protective gloves: rubber gloves;

Eye protection: goggles;

Industrial hygiene: use good industrial hygiene. Wear face shield or goggles, elbow length PVC gloves, cotton overalls buttoned to the neck and wrist, washable hat and half face respirator with dust and vapor cartridge. After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water.

9. Physical and Chemical Properties

Appearance: White powder;

Boiling point: Decomposes before boiling;

Vapor pressure: 0.0088mPa (25°C);

Melting point: Decomposes before melting;

Water solubility: 20mg/l (20°C);

Degradation point: 165°C;

Flash point: Not highly flammable;

Ignition temperature: Not applicable.

10. Stability and Reactivity

Stability: stable under the normal conditions;

Conditions to avoid: Fire, heat and high temperature;

Products to avoid: Incompatible with highly alkaline materials, oxidizing agents, lime sulfur, bordeaux mixture, copper compounds;

Hazardous decomposition products: Thermal decomposition generates oxides of nitrogen, sulfur, and carbon.

11. Toxicological Information

Acute oral LD₅₀ for rat: >5000mg/kg;

Acute dermal LD₅₀ for rat: >2000mg/kg;

Inhalation LD50 (4h) for rat: 1.7mg/l;

Skin irritant for rabbit: Slight irritant;

Eye irritant for rabbit: Moderate irritant;

Sensitisation for guinea pigs: Slight skin sensitiser.

Reproductive effects: Groups of Charles-River rats (10 males and 20 females per group) were fed levels of thiophanate-methyl in the diet at 0, 40, 160, 640 ppm in a three-generation, two-litters per generation reproduction study. There were no apparent effects of thiophanate-methyl at levels up to and including 640 ppm on any of the reproduction parameters measured in this experiment. In addition, gross and histological examinations of the F_{3b} generation were performed on several tissues and organs of three-week-old rats and a further group of animals was examined for skeletal abnormalities. In no instance was there any effect of feeding thiophanate-methyl on reproduction. There was a definitive effect on the growth of animals fed dietary levels of 640 ppm.

Teratogenic effects: Thiophanate-methyl was administered to pregnant ICR mice from day 1 to day 15 of gestation at levels of 0, 40, 200, 500 and 1000 mg/kg/day. At 1000 mg/kg/day there was a significantly reduced number of living fetuses. No (significant) differences in the number of implantation sites, body weight of fetuses or fetal mortality or body weight were observed at the lower dosage levels. The administration of thiophanate-methyl did not produce gross internal or external abnormalities and the study did not reveal any teratogenic properties under these experimental conditions.

Mutagenic effects: Groups of 10 males ICR-strain mice were administered thiophanate-methyl intraperitoneally at a single dose level of 0, 8, 40, 200, 400 or 500 mg/kg and mated with virgin females which were replaced weekly for a period of eight weeks. At a dosage of 400 mg/kg and above there appeared to be a reduction in the incidence of pregnancies. However, there was no systematic variation indicative of a mutagenic potential over the entire eight-week mating period.

Carcinogenic effects: There were no effects on tumor incidence in two-year feeding studies of mice or rats consuming the equivalent of up to 96 mg/kg body weight/day (640

ppm) or 32 mg/kg body weight/day of thiophanate-methyl, respectively. The metabolite MBC has produced liver tumors in two closely-related strains of mice which are susceptible to developing such tumors, but not in an unrelated mouse strain or in rats.

12. Ecological And Ecotoxicological Information

Effects on birds:

LD50 for wild duck : >4640mg/kg;

Effects on aquatic organisms:

LC50 (48h) for rainbow trout : 11.0mg/l;

Effects on other organisms:

LD50 for bees: >100µg/bee.

13. Disposal Considerations

Material that cannot be used at the site should be disposed of in an approved waste disposal facility following all applicable Federal, State and Local regulations. If burned, stay out of smoke. Do not contaminate water supplies by disposal of wastes or containers.

14. Transport Information

Not applicable.

15. Regulatory Information

Not applicable.

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.