

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 Permethrin

1.2 Other means of identification

Product number CCPD101557
Other names -

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
Acute toxicity - Category 4, Inhalation
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
H332 Harmful if inhaled
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/...
P271 Use only outdoors or in a well-ventilated area.
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. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P317 Get medical help. 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
Permethrin	m-phenoxybenzyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	52645-53-1	258-067-9	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest.

Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap.

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. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]: Inhalation of material may be harmful. Contact may cause burns to skin and eyes. Inhalation of Asbestos dust may have a damaging effect on the lungs. Fire may produce irritating, corrosive and/or toxic gases. Some liquids produce vapors that may cause dizziness or suffocation. Runoff from fire control may cause pollution. (ERG, 2016)

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

Skin decontamination. Wash skin promptly with soap and water . If irritant or paresthetic effects occur, obtain treatment by a physician. Because volatilization of pyrethroids apparently accounts for paresthesia affecting the face, strenuous measures should be taken (ventilation, protective face mask and hood) to avoid vapor contact with the face and eyes. Vitamin E oil preparations (dL-alpha tocopheryl acetate) are uniquely effective in preventing and stopping the paresthetic reaction. They are safe for application to the skin under field conditions. Corn oil is somewhat effective, but possible side effects with continuing use make it less suitable. Vaseline is less effective than corn oil. Zinc oxide actually worsens the reaction. Pyrethroids

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]: SMALL FIRE: Dry chemical, CO2, water spray or regular foam. LARGE FIRE: Water spray, fog or regular foam. Do not scatter spilled material with high-pressure water streams. Move containers from fire area if you can do it without risk. Dike fire-control water for later disposal. FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. (ERG, 2016)

5.2 Specific hazards arising from the chemical

Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]: Some may burn but none ignite readily. Containers may explode when heated. Some may be transported hot. For UN3508, be aware of possible short circuiting as this product is transported in a charged state. (ERG, 2016)

5.3 Special protective actions for fire-fighters

Use powder, AFFF, foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

6.2 Environmental precautions

Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

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

Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs. Keep in a well-ventilated room.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

no data available

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 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	Permethrin is a pale brown liquid. Relatively water insoluble. Used as an insecticide.
Colour	Colorless crystals to a viscous liquid; Color, white to pale yellow
Odour	no data available
Melting point/freezing point	34-35°C
Boiling point or initial boiling point and boiling range	465.9°C at 760mmHg
Flammability	Combustible. Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit	no data available
Flash point	159.4°C
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	In water: insoluble
Partition coefficient n-octanol/water	6.5

Vapour pressure	5.18X10 ⁻⁸ mm Hg at 25 deg C (OECD Method 104)
Density and/or relative density	1.19
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on burning. This produces toxic fumes including hydrogen chloride.

10.2 Chemical stability

Stable to heat (> or = 2 yr at 50 deg C), more stable in acid than alkaline media with optimum stability ca. pH 4; some photochemical degradation has been observed in laboratory studies but field data indicate this does not adversely affect biological performances.

10.3 Possibility of hazardous reactions

A pyrethroid derivative.

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

no data available

10.6 Hazardous decomposition products

When heated to decomp it emits toxic fumes of /hydrogen chloride/.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Rat oral 1,500 mg/kg
- Inhalation: no data available
- Dermal: LD50 Rat percutaneous > 4000 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

The /Environmental Protection/ Agency classified permethrin as "Likely to be Carcinogenic to Humans" by the oral route. This classification was based on two reproducible benign tumor types (lung and liver) in the mouse, equivocal evidence of carcinogenicity in Long-Evans rats, and supporting structural activity relationships (SAR) information. For the purpose of risk characterization, a low dose extrapolation model (Q1*) was used. The Q1* is 9.6 x 10⁻³ (mg/kg/day)-1 and was derived from the female mouse lung (adenoma and/or carcinoma) tumors

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the eyes, skin and respiratory tract.

STOT-repeated exposure

no data available

Aspiration hazard

No indication can be given about the rate at which a harmful concentration of this substance in the air is reached on evaporation at 20°C.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50; Species: *Pimephales promelas* (fathead minnow); Conditions: flow through bioassay with measured concentrations, 25.4 deg C, dissolved oxygen 7.5 mg/L, hardness 45.7 mg/L calcium carbonate, alkalinity 41.6 mg/L calcium carbonate, and pH 7.1; Concentration: 16.0 mg/L for 96 hr (confidence limit 8.71- 29.6 mg/L)

- Toxicity to daphnia and other aquatic invertebrates: LC50; Species: *Daphnia magna* (Water flea); Conditions: freshwater, static, 22 deg C, pH 8.2-8.3, hardness 162-178 mg/L CaCO₃, alkalinity 107-114 mg/L CaCO₃, dissolved oxygen 7.8-8.1 mg/L; Concentration: 12.4 ug/L for 24 hr /formulation
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: The half-life of permethrin in aerobically incubated soil is less than 4 weeks, and the degradation of the trans isomer is more rapid than the cis isomer(1). Permethrin was stable in sterile Hagerstown silty clay loam indicating that any degradation probably was microbial(2); as expected ester hydrolysis predominated in non-sterile soil(2). In two Japanese soils, both the 1R, trans- and 1R, cis-isomers were rapidly degraded under dry conditions with half-lives of less than 2 days(2). The half-life in a sediment-seawater solution was less than 2.5 days; under sterile conditions there was no significant change in permethrin concentration(3). Aerobic incubation of ¹⁴C-labeled cis- and trans-isomers and stereo-isomers of permethrin in turfgrass soil and coverground soil from California resulted in losses of 68.6-78.9% and 86.3-90.4% after 14 days for the cis- and trans-isomers respectively, and 93.0-99.2% and 95.4-98.5% after 56 days for the cis- and trans-isomers respectively(4); degradation products included cyclopropanoic acid, 3-phenoxybenzoic acid and 3-phenoxybenzyl alcohol(4); degradation losses in sediment were greater under aerobic conditions compared to anaerobic conditions after 14 days (trans-isomers had 76.2-81.2% loss under aerobic conditions and 65.7-74.1% loss under anaerobic conditions)(4). Stereo-isomers of cis-permethrin had half-lives of 139-141 days when incubated in sterilized soil or sediments and half-lives of 99-126 days in non-sterile aerobic or anaerobic soil or sediments(5).

12.3 Bioaccumulative potential

The BCF values for permethrin in rainbow trout (*Oncorhynchus mykiss*) and sheepshead minnow (*Cyprinodon vagiegatus*) were approximately 560 and 480, respectively(1,2). According to a classification scheme(3), these BCF values suggest the potential for bioconcentration in aquatic organisms is high(SRC). A BCF of 1,900 was also reported for oysters(2). Insect BCF values after 6 hr of exposure to sublethal permethrin concentrations were 18, 30, 7, 4, and 24 for black fly, caddisfly, damselfly, water scavenger, and mayfly, respectively(4).

12.4 Mobility in soil

Koc values for permethrin range from 10,471 to 86,000 that were measured in a variety of different soils including silt loam, sandy loam, sediments and sand(1); the selected Koc value (for use in modeling) is 39,300(1). Koc values for silt loam (Ohio), sandy loam (Wisconsin), sediment (Georgia), and sand (Florida) were 19,300 (Kd = 236; organic matter, 0.71%), 20,900 (Kd = 217; organic matter, 0.60%), 44,700 (Kd = 401; organic matter, 0.91%), and 60,900 (Kd = 140; organic matter, 0.13%), respectively(1). The Kd for permethrin was measured to be 400 on a red earth soil from Australia with an organic matter content of 1.09%(2) which corresponds to a Koc of about 63,100(SRC). According to a classification scheme(3), these Koc values suggest that permethrin is expected to be immobile in soil(SRC). The distribution coefficients (Kd) for permethrin on clean (i.e., without organic matter) montmorillonite, aluminum oxide and kaolinite clay mineral surfaces were 61, 41, and 5 ml/g, respectively(4).

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: UN1230 (For reference only, please check.) IMDG: UN1230 (For reference only, please check.) IATA: UN1230 (For reference only, please check.)

14.2 UN Proper Shipping Name

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

14.3 Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.) IMDG: 3 (For reference only, please check.) IATA: 3 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: II (For reference only, please check.) IMDG: II (For reference only, please check.) IATA: II (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
m-phenoxybenzyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	m-phenoxybenzyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	52645-53-1	258-067-9
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			Not 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

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

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