Permethrin Formulation

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Permethrin Formulation

Manufacturer or supplier's details
Company: MSD
Address: No. 485 Jing Tai Road
Pu Tuo District - Shanghai - China 200331
Telephone: +1-908-740-4000
Emergency telephone number: 86-571-87268110
E-mail address: EHSDATASTEWARD@msd.com

Recommended use of the chemical and restrictions on use
Recommended use: Veterinary product

2. HAZARDS IDENTIFICATION

Emergency Overview

| Appearance | liquid |
| Colour | clear |
| Odour | aromatic |

Flammable liquid and vapour. May be harmful if swallowed. May be fatal if swallowed and enters airways. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause drowsiness or dizziness. May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure. Very toxic to aquatic life with long lasting effects.

GHS Classification

| Flammable liquids | Category 3 |
| Acute toxicity (Oral) | Category 5 |
| Skin corrosion/irritation | Category 2 |
| Serious eye damage/eye irritation | Category 2A |
| Skin sensitisation | Category 1 |
| Germ cell mutagenicity | Category 1B |
| Carcinogenicity | Category 1B |
| Reproductive toxicity | Category 2 |
| Specific target organ toxicity | Category 3 |
## Permethrin Formulation

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date</th>
<th>SDS Number</th>
<th>Date of last issue</th>
<th>Date of first issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td>2021/03/17</td>
<td>829655-00011</td>
<td>2020/10/10</td>
<td>2016/08/02</td>
</tr>
</tbody>
</table>

- **single exposure**
- **Specific target organ toxicity - repeated exposure**: Category 2
- **Aspiration hazard**: Category 1
- **Short-term (acute) aquatic hazard**: Category 1
- **Long-term (chronic) aquatic hazard**: Category 1

### GHS label elements

**Hazard pictograms**

![Pictograms for Flammable, Skin Irrit, Toxic Inhalation, Plants]

**Signal word**: Danger

**Hazard statements**:  
H226 Flammable liquid and vapour.  
H303 May be harmful if swallowed.  
H304 May be fatal if swallowed and enters airways.  
H315 Causes skin irritation.  
H317 May cause an allergic skin reaction.  
H319 Causes serious eye irritation.  
H336 May cause drowsiness or dizziness.  
H340 May cause genetic defects.  
H350 May cause cancer.  
H361 Suspected of damaging fertility or the unborn child.  
H373 May cause damage to organs through prolonged or repeated exposure.  
H410 Very toxic to aquatic life with long lasting effects.

**Precautionary statements**:  
**Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.  
P233 Keep container tightly closed.  
P241 Use explosion-proof electrical/ ventilating/ lighting equipment.  
P242 Use only non-sparking tools.  
P243 Take precautionary measures against static discharge.  
P260 Do not breathe mist or vapours.  
P264 Wash skin thoroughly after handling.  
P271 Use only outdoors or in a well-ventilated area.  
P272 Contaminated work clothing should not be allowed out of the workplace.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/ protective clothing/ eye protec-
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Response:
- P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
- P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P312 Call a POISON CENTER/ doctor if you feel unwell.
- P331 Do NOT induce vomiting.
- P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
- P337 + P313 If eye irritation persists: Get medical advice/ attention.
- P362 + P364 Take off contaminated clothing and wash it before reuse.
- P391 Collect spillage.

Storage:
- P403 + P235 Store in a well-ventilated place. Keep cool.
- P405 Store locked up.

Disposal:
- P501 Dispose of contents/ container to an approved waste disposal plant.

Physical and chemical hazards
Flammable liquid and vapour.

Health hazards
May be harmful if swallowed. Causes skin irritation. Causes serious eye irritation. May cause an allergic skin reaction. May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. May cause drowsiness or dizziness. May cause damage to organs through prolonged or repeated exposure. May be fatal if swallowed and enters airways.

Environmental hazards
Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Other hazards which do not result in classification
Vapours may form explosive mixture with air.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chemical name</td>
</tr>
<tr>
<td></td>
<td>Solvent naphtha (petroleum), light aromatic</td>
</tr>
<tr>
<td></td>
<td>Xylene</td>
</tr>
<tr>
<td></td>
<td>Permethrin (ISO)</td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

General advice: In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.

If inhaled: If inhaled, remove to fresh air. Get medical attention.

In case of skin contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

In case of eye contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention.

If swallowed: If swallowed, DO NOT induce vomiting. If vomiting occurs have person lean forward. Call a physician or poison control centre immediately. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed: May be harmful if swallowed. May be fatal if swallowed and enters airways. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause drowsiness or dizziness. May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure.

Protection of first-aiders: First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

Notes to physician: Treat symptomatically and supportively.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water spray
Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media: High volume water jet

Specific hazards during fire-
SAFETY DATA SHEET
according to GB/T 16483 and GB/T 17519

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fighting

Flash back possible over considerable distance. Vapours may form explosive mixtures with air. Exposure to combustion products may be a hazard to health.

Hazardous combustion products:
- Chlorine compounds
- Carbon oxides
- Sulphur oxides
- Metal oxides

Specific extinguishing methods:
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Use water spray to cool unopened containers.
- Remove undamaged containers from fire area if it is safe to do so.
- Evacuate area.

Special protective equipment for firefighters:
- In the event of fire, wear self-contained breathing apparatus.
- Use personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:
- Remove all sources of ignition.
- Use personal protective equipment.
- Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

Environmental precautions:
- Avoid release to the environment.
- Prevent further leakage or spillage if safe to do so.
- Prevent spreading over a wide area (e.g. by containment or oil barriers).
- Retain and dispose of contaminated wash water.
- Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up:
- Non-sparking tools should be used.
- Soak up with inert absorbent material.
- Suppress (knock down) gases/vapours/mists with a water spray jet.
- For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container.
- Clean up remaining materials from spill with suitable absorbent.
- Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.
- Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

7. HANDLING AND STORAGE

Handling
SAFETY DATA SHEET
according to GB/T 16483 and GB/T 17519

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Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Local/Total ventilation : If sufficient ventilation is unavailable, use with local exhaust ventilation.
Use explosion-proof electrical, ventilating and lighting equipment.

Advice on safe handling : Do not get on skin or clothing.
Do not breathe mist or vapours.
Do not swallow.
Do not get in eyes.
Wash skin thoroughly after handling.
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment
Non-sparking tools should be used.
Keep container tightly closed.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Take precautionary measures against static discharges.
Take care to prevent spills, waste and minimize release to the environment.

Avoidance of contact : Oxidizing agents

Storage

Conditions for safe storage : Keep in properly labelled containers.
Store locked up.
Keep tightly closed.
Keep in a cool, well-ventilated place.
Store in accordance with the particular national regulations.
Keep away from heat and sources of ignition.

Materials to avoid : Do not store with the following product types:
Self-reactive substances and mixtures
Organic peroxides
Oxidizing agents
Flammable gases
Pyrophoric liquids
Pyrophoric solids
Self-heating substances and mixtures
Poisonous gases
Explosives

Packaging material : Unsuitable material: None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solvent naphtha (petroleum), light aromatic</td>
<td>64742-95-6</td>
<td>TWA</td>
<td>200 mg/m3 (total hydrocarbon vapor)</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Xylene</td>
<td>1330-20-7</td>
<td>PC-TWA</td>
<td>50 mg/m3</td>
<td>CN OEL</td>
</tr>
</tbody>
</table>

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Biological occupational exposure limits

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Biological specimen</th>
<th>Sampling time</th>
<th>Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>1330-20-7</td>
<td>methylhippuric acids</td>
<td>Urine</td>
<td>End of shift</td>
<td>0.3 g/g creatinine</td>
<td>CN BEI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>methylhippuric acids</td>
<td>Urine</td>
<td>End of shift</td>
<td>0.4 g/l</td>
<td>CN BEI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Methylhippuric acids</td>
<td>Urine</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>1.5 g/g creatinine</td>
<td>ACGIH BEI</td>
</tr>
</tbody>
</table>

Engineering measures:
Minimize workplace exposure concentrations. If sufficient ventilation is unavailable, use with local exhaust ventilation. Use explosion-proof electrical, ventilating and lighting equipment.

Personal protective equipment

Respiratory protection:
If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.

Filter type:
Combined particulates and organic vapour type

Eye/face protection:
Wear the following personal protective equipment:
Safety goggles

Skin and body protection:
Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential. Wear the following personal protective equipment:
If assessment demonstrates that there is a risk of explosive atmospheres or flash fires, use flame retardant antistatic protective clothing.
Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

Hand protection
Material:
Chemical-resistant gloves

Remarks:
Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to
Hygiene measures:

If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>clear</td>
</tr>
<tr>
<td>Odour</td>
<td>aromatic</td>
</tr>
<tr>
<td>Odour Threshold</td>
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<tr>
<td>pH</td>
<td>6.69</td>
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<tr>
<td>Melting point/freezing point</td>
<td>No data available</td>
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<tr>
<td>Initial boiling point and boiling range</td>
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</tr>
<tr>
<td>Flash point</td>
<td>51.1 °C</td>
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<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (liquids)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper explosion limit / Upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower explosion limit / Lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>15 mmHg (25 °C)</td>
</tr>
<tr>
<td>Relative vapour density</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.870 - 0.880 (25 °C)</td>
</tr>
<tr>
<td>Density</td>
<td>No data available</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td></td>
</tr>
<tr>
<td>Water solubility</td>
<td>emulsifiable</td>
</tr>
</tbody>
</table>
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Partition coefficient: n-octanol/water : Not applicable
Auto-ignition temperature : No data available
Decomposition temperature : No data available

Viscosity
Viscosity, dynamic : No data available
Viscosity, kinematic : No data available

Explosive properties : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.
Molecular weight : No data available
Particle size : Not applicable

10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.
Chemical stability : Stable under normal conditions.
Possibility of hazardous reactions
Flammable liquid and vapour.
Vapours may form explosive mixture with air.
Can react with strong oxidizing agents.

Conditions to avoid : Heat, flames and sparks.
Incompatible materials : Oxidizing agents
Hazardous decomposition products : No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

Exposure routes : Inhalation
Skin contact
Ingestion
Eye contact

Acute toxicity
May be harmful if swallowed.

Product:
Acute oral toxicity : Acute toxicity estimate: 3,022 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: > 40 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: > 5,000 mg/kg
Components:

Solvent naphtha (petroleum), light aromatic:
- Acute oral toxicity: LD50 (Rat): > 5,000 mg/kg
- Acute inhalation toxicity: LC50 (Rat): > 5.61 mg/l
  Exposure time: 4 h
  Test atmosphere: vapour
- Acute dermal toxicity: LD50 (Rabbit): > 2,000 mg/kg

Xylene:
- Acute oral toxicity: LD50 (Rat): 3,523 mg/kg
- Acute inhalation toxicity: LC50 (Rat): 27.571 mg/l
  Exposure time: 4 h
  Test atmosphere: vapour
- Acute dermal toxicity: LD50 (Rabbit): > 4,200 mg/kg

Permethrin (ISO):
- Acute oral toxicity: LD50 (Rat): 480 - 554 mg/kg
- Acute inhalation toxicity: LC50 (Rat): 2.3 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
- Acute dermal toxicity: LD50 (Rabbit): > 2,000 mg/kg

4-Nonylphenol, branched, ethoxylated:
- Acute oral toxicity: LD50 (Rat): > 2,000 mg/kg

Calcium bis(dodecylbenzenesulphonate), branched:
- Acute oral toxicity: LD50 (Rat): 404 - 1,980 mg/kg
  Remarks: Based on data from similar materials
- Acute dermal toxicity: LD50 (Rat): > 2,000 mg/kg
  Remarks: Based on data from similar materials

Skin corrosion/irritation
Causes skin irritation.

Components:

Solvent naphtha (petroleum), light aromatic:
- Species: Rabbit
- Method: OECD Test Guideline 404
Result: Skin irritation

**Xylene:**
Species: Rabbit
Result: Skin irritation

**Permethrin (ISO):**
Species: Rabbit
Result: No skin irritation

**4-Nonylphenol, branched, ethoxylated:**
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation
Remarks: Based on data from similar materials

**Calcium bis(dodecylbenzenesulphonate), branched:**
Species: Rabbit
Method: OECD Test Guideline 404
Result: Skin irritation
Remarks: Based on data from similar materials

**Serious eye damage/eye irritation**
Causes serious eye irritation.

**Components:**

**Solvent naphtha (petroleum), light aromatic:**
Species: Rabbit
Result: No eye irritation
Method: OECD Test Guideline 405

**Xylene:**
Species: Rabbit
Result: Irritation to eyes, reversing within 21 days

**Permethrin (ISO):**
Species: Rabbit
Result: No eye irritation

**4-Nonylphenol, branched, ethoxylated:**
Species: Rabbit
Result: No eye irritation
Method: OECD Test Guideline 405
Remarks: Based on data from similar materials

**Calcium bis(dodecylbenzenesulphonate), branched:**
Species: Rat
Result : Irreversible effects on the eye
Method : OECD Test Guideline 405
Remarks : Based on data from similar materials

Respiratory or skin sensitisation

Skin sensitisation
May cause an allergic skin reaction.

Respiratory sensitisation
Not classified based on available information.

Components:

Solvent naphtha (petroleum), light aromatic:
Test Type : Buehler Test
Exposure routes : Skin contact
Species : Guinea pig
Result : negative

Xylene:
Test Type : Local lymph node assay (LLNA)
Exposure routes : Skin contact
Species : Mouse
Result : negative

Permethrin (ISO):
Test Type : Buehler Test
Exposure routes : Skin contact
Species : Guinea pig
Result : positive
Assessment : Probability or evidence of skin sensitisation in humans

4-Nonylphenol, branched, ethoxylated:
Test Type : Maximisation Test
Exposure routes : Skin contact
Species : Guinea pig
Result : negative
Remarks : Based on data from similar materials

Calcium bis(dodecylbenzenesulphonate), branched:
Test Type : Maximisation Test
Exposure routes : Skin contact
Species : Guinea pig
Result : negative
Remarks : Based on data from similar materials

Germ cell mutagenicity
May cause genetic defects.
Components:

Solvent naphtha (petroleum), light aromatic:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES) Result: negative
Test Type: In vitro mammalian cell gene mutation test Result: positive
Genotoxicity in vivo: Test Type: Sister chromatid exchange analysis in spermatogonia Species: Mouse Application Route: Intraperitoneal injection Result: positive
Germ cell mutagenicity - Assessment: Positive result(s) from in vivo heritable germ cell mutagenicity tests in mammals

Xylene:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES) Result: negative
Test Type: Chromosome aberration test in vitro Result: negative
Test Type: In vitro mammalian cell gene mutation test Result: negative
Test Type: In vitro sister chromatid exchange assay in mammalian cells Result: negative
Genotoxicity in vivo: Test Type: Rodent dominant lethal test (germ cell) (in vivo) Species: Mouse Application Route: Skin contact Result: negative

Permethrin (ISO):
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES) Result: negative
Test Type: In vitro mammalian cell gene mutation test Result: negative
Test Type: Chromosome aberration test in vitro Result: negative
Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro) Result: negative
Test Type: Chromosome aberration test in vitro Result: positive
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Genotoxicity in vivo:
- Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
- Species: Mouse
- Result: negative

- Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
- Species: Mouse
- Result: negative

- Test Type: Rodent dominant lethal test (germ cell) (in vivo)
- Species: Mouse
- Result: negative

- Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
  - Species: Rat
  - Application Route: Intraperitoneal injection
  - Result: negative

- Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
  - Species: Mouse
  - Application Route: Ingestion
  - Result: positive

Germ cell mutagenicity - Assessment:
Weight of evidence does not support classification as a germ cell mutagen.

4-Nonylphenol, branched, ethoxylated:
Genotoxicity in vitro:
- Test Type: Bacterial reverse mutation assay (AMES)
  - Method: OECD Test Guideline 471
  - Result: negative
  - Remarks: Based on data from similar materials

- Test Type: Chromosome aberration test in vitro
  - Method: OECD Test Guideline 473
  - Result: negative
  - Remarks: Based on data from similar materials

- Test Type: In vitro mammalian cell gene mutation test
  - Method: OECD Test Guideline 476
  - Result: negative
  - Remarks: Based on data from similar materials

Calcium bis(dodecylbenzenesulphonate), branched:
Genotoxicity in vitro:
- Test Type: Bacterial reverse mutation assay (AMES)
  - Method: OECD Test Guideline 471
  - Result: negative
  - Remarks: Based on data from similar materials

- Test Type: Chromosome aberration test in vitro
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Method: OECD Test Guideline 473
Result: negative
Remarks: Based on data from similar materials

Genotoxicity in vivo:
Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Carcinogenicity
May cause cancer.

Components:
Solvent naphtha (petroleum), light aromatic:
Species: Mouse
Application Route: Skin contact
Exposure time: 2 Years
Result: positive

Carcinogenicity - Assessment:
Sufficient evidence of carcinogenicity in animal experiments

Xylene:
Species: Rat
Application Route: Ingestion
Exposure time: 103 weeks
Result: negative

Permethrin (ISO):
Species: Rat
Result: negative

Species:
Result:
Species:
Result:

Reproductive toxicity
Suspected of damaging fertility or the unborn child.

Components:
Solvent naphtha (petroleum), light aromatic:
Effects on fertility:
Test Type: Reproduction/Developmental toxicity screening test
Species: Rat
Application Route: Inhalation (vapour)
Result: negative

Effects on foetal development:
Test Type: Embryo-foetal development
Species: Rat
Application Route: Inhalation (vapour)
Xylene:
Effects on fertility: Test Type: One-generation reproduction toxicity study
Species: Rat
Application Route: inhalation (vapour)
Result: negative

Effects on foetal development: Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (vapour)
Result: negative

Permethrin (ISO):
Effects on fertility: Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative

Effects on foetal development: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Result: negative

4-Nonylphenol, branched, ethoxylated:
Reproductive toxicity - Assessment: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

Calcium bis(dodecylbenzenesulphonate), branched:
Effects on fertility: Test Type: Three-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative
Remarks: Based on data from similar materials

STOT - single exposure
May cause drowsiness or dizziness.

Components:
Solvent naphtha (petroleum), light aromatic:
Assessment: May cause drowsiness or dizziness.
Xylene:
Assessment: May cause respiratory irritation.

STOT - repeated exposure
May cause damage to organs through prolonged or repeated exposure.

Components:

Xylene:
Exposure routes: inhalation (vapour)
Target Organs: Auditory system
Assessment: Shown to produce significant health effects in animals at concentrations of >0.2 to 1 mg/l/6h/d.

Repeated dose toxicity

Components:

Solvent naphtha (petroleum), light aromatic:
Species: Rat
LOAEL: 500 mg/kg
Application Route: Ingestion
Exposure time: 28 Days

Xylene:
Species: Rat
LOAEL: > 0.2 - 1 mg/l
Application Route: inhalation (vapour)
Exposure time: 13 Weeks
Remarks: Based on data from similar materials

Species: Rat
LOAEL: 150 mg/kg
Application Route: Ingestion
Exposure time: 90 Days

Permethrin (ISO):
Species: Rat
NOAEL: 0.2201 mg/l
Application Route: Inhalation
Exposure time: 90 Days

Species: Rat
NOAEL: 175 mg/kg
Application Route: Ingestion
Exposure time: 90 Days

4-Nonylphenol, branched, ethoxylated:
Species: Rat
Permethrin Formulation

LOAEL: 150 mg/kg
Application Route: Ingestion
Exposure time: 90 Days
Method: OPPTS 870.3100
Remarks: Based on data from similar materials

Aspiration toxicity
May be fatal if swallowed and enters airways.

Components:
Solvent naphtha (petroleum), light aromatic:
The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

Xylene:
The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:
Solvent naphtha (petroleum), light aromatic:
Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 8.2 mg/l
    Exposure time: 96 h
    Test substance: Water Accommodated Fraction

Toxicity to daphnia and other aquatic invertebrates: EL50 (Daphnia magna (Water flea)): 4.5 mg/l
    Exposure time: 48 h
    Test substance: Water Accommodated Fraction
    Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants: EL50 (Pseudokirchneriella subcapitata (microalgae)): 3.1 mg/l
    Exposure time: 96 h
    Test substance: Water Accommodated Fraction
    Method: OECD Test Guideline 201

    NOELR (Pseudokirchneriella subcapitata (microalgae)): 0.5 mg/l
    Exposure time: 96 h
    Test substance: Water Accommodated Fraction
    Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOELR (Daphnia magna (Water flea)): 2.6 mg/l
    Exposure time: 21 d
    Test substance: Water Accommodated Fraction
    Method: OECD Test Guideline 211
**Permethrin Formulation**

<table>
<thead>
<tr>
<th>Xylene:</th>
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</thead>
</table>
| Toxicity to fish | LC50 (Oncorhynchus mykiss (rainbow trout)): 13.5 mg/l  
Exposure time: 96 h |
| Toxicity to daphnia and other aquatic invertebrates | EC50 (Daphnia magna (Water flea)): > 1 - 10 mg/l  
Exposure time: 24 h  
Method: OECD Test Guideline 202  
Remarks: Based on data from similar materials |
| Toxicity to algae/aquatic plants | EC50 (Skeletonema costatum (marine diatom)): 10 mg/l  
Exposure time: 72 h |
| Toxicity to fish (Chronic toxicity) | NOEC (Danio rerio (zebra fish)): > 0.1 - < 1 mg/l  
Exposure time: 35 d  
Method: OECD Test Guideline 210  
Remarks: Based on data from similar materials |
| Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) | EL10 (Daphnia magna (Water flea)): > 1 - 10 mg/l  
Exposure time: 21 d  
Method: OECD Test Guideline 211  
Remarks: Based on data from similar materials |
| Toxicity to microorganisms | NOEC: > 100 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209  
Remarks: Based on data from similar materials |

<table>
<thead>
<tr>
<th>Permethrin (ISO):</th>
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</thead>
</table>
| Toxicity to fish | LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.00079 mg/l  
Exposure time: 96 h |
| Toxicity to daphnia and other aquatic invertebrates | EC50 (Daphnia magna (Water flea)): 0.0001 mg/l  
Exposure time: 48 h |
| Toxicity to algae/aquatic plants | ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1.13 mg/l  
Exposure time: 72 h  
EC10 (Pseudokirchneriella subcapitata (green algae)): 0.0023 mg/l  
Exposure time: 72 h |
| M-Factor (Acute aquatic toxicity) | 10,000 |
| Toxicity to fish (Chronic toxicity) | NOEC (Danio rerio (zebra fish)): 0.00041 mg/l  
Exposure time: 35 d  
Method: OECD Test Guideline 210 |
| Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) | NOEC (Daphnia magna (Water flea)): 0.0047 µg/l  
Exposure time: 21 d  
Method: OECD Test Guideline 211 |
| M-Factor (Chronic aquatic) | 10,000 |
Toxicity to microorganisms:  
EC50: > 1,000 mg/l  
Exposure time: 3 h

4-Nonylphenol, branched, ethoxylated:  
Toxicity to fish:  
LC50 (Oryzias latipes (Orange-red killifish)): 8.2 mg/l  
Exposure time: 96 h

Calcium bis(dodecylbenzenesulphonate), branched:  
Toxicity to fish:  
LC50: > 1 - 10 mg/l  
Exposure time: 96 h  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates:  
EC50 (Daphnia magna (Water flea)): 62 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants:  
ErC50 (Pseudokirchneriella subcapitata (green algae)): > 10 - 100 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
Remarks: Based on data from similar materials

NOEC (Pseudokirchneriella subcapitata (green algae)): > 1 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
Remarks: Based on data from similar materials

Persistence and degradability

Components:

Solvent naphtha (petroleum), light aromatic:  
Biodegradability:  
Result: Inherently biodegradable.  
Biodegradation: 94 %  
Exposure time: 25 d

Xylene:  
Biodegradability:  
Result: Readily biodegradable.  
Biodegradation: > 70 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F  
Remarks: Based on data from similar materials

Permethrin (ISO):  
Biodegradability:  
Result: Not readily biodegradable.  
Method: OECD Test Guideline 301F

4-Nonylphenol, branched, ethoxylated:
Biodegradability: Result: Not readily biodegradable.

Calcium bis(dodecylbenzenesulphonate), branched:
Biodegradability: Result: Readily biodegradable.
Remarks: Based on data from similar materials

Bioaccumulative potential

Components:

Xylene:
Partition coefficient: n-octanol/water: log Pow: 3.16
Remarks: Calculation

Permethrin (ISO):
Bioaccumulation: Species: Lepomis macrochirus (Bluegill sunfish)
Bioconcentration factor (BCF): 570
Partition coefficient: n-octanol/water: log Pow: 4.67

4-Nonylphenol, branched, ethoxylated:
Bioaccumulation: Species: Fish
Bioconcentration factor (BCF): < 100
Remarks: Based on data from similar materials

Calcium bis(dodecylbenzenesulphonate), branched:
Partition coefficient: n-octanol/water: Remarks: Not applicable

Mobility in soil
No data available

Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues: Dispose of in accordance with local regulations.
Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.
Empty containers retain residue and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury and/or death. If not otherwise specified: Dispose of as unused product.

14. TRANSPORT INFORMATION

International Regulations
15. REGULATORY INFORMATION

National regulatory information

Law on the Prevention and Control of Occupational Diseases
Permethrin Formulation

Regulations on Safety Management of Hazardous Chemicals
Catalogue of Hazardous Chemicals: Listed

Identification of Major Hazard Installations for Hazardous Chemicals (GB 18218)

<table>
<thead>
<tr>
<th>No. / Code</th>
<th>Chemical name / Category</th>
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<tbody>
<tr>
<td>W5.4</td>
<td>Flammable liquids</td>
<td>5,000 t</td>
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The components of this product are reported in the following inventories:

- AICS: not determined
- DSL: not determined
- IECSC: not determined

16. OTHER INFORMATION

Further information


Date format: yyyy/mm/dd

Full text of other abbreviations

- ACGIH: USA. ACGIH Threshold Limit Values (TLV)
- ACGIH BEI: ACGIH - Biological Exposure Indices (BEI)
- CN BEI: China. Biological Occupational Exposure Indices
- CN OEL: Occupational exposure limits for hazardous agents in the workplace - Chemical hazardous agents.

- ACGIH / TWA: 8-hour, time-weighted average
- ACGIH / STEL: Short-term exposure limit
- CN OEL / PC-TWA: Permissible concentration - time weighted average
- CN OEL / PC-STEL: Permissible concentration - short term exposure limit

Additional abbreviations:

- ACII - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50% of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect
Permethrin Formulation

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date:</th>
<th>SDS Number:</th>
<th>Date of last issue:</th>
<th>Date of first issue:</th>
</tr>
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<tbody>
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<td>2021/03/17</td>
<td>829655-00011</td>
<td>2020/10/10</td>
<td>2016/08/02</td>
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</table>

Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user’s end product, if applicable.

CN / EN