1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Ivermectin (with Propylene Glycol) Formulation

Manufacturer or supplier's details

Company: MSD
Address: No. 485 Jing Tai Road
Pu Tuo District - Shanghai - China 200331
Telephone: 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

<table>
<thead>
<tr>
<th>Appearance</th>
<th>liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Colorless to pale yellow</td>
</tr>
<tr>
<td>Odour</td>
<td>characteristic</td>
</tr>
</tbody>
</table>

Highly flammable liquid and vapour. May be harmful if swallowed. May be harmful if swallowed and enters airways. Causes serious eye irritation. May cause damage to organs. May cause damage to organs through prolonged or repeated exposure. Very toxic to aquatic life with long lasting effects.

GHS Classification

| Flammable liquids          | Category 2 |
| Acute toxicity (Oral)      | Category 5  |
| Serious eye damage/eye irritation | Category 2A   |
| Specific target organ toxicity - single exposure | Category 2 |
| Specific target organ toxicity - repeated exposure | Category 2 |
| Aspiration hazard          | Category 2  |
| Short-term (acute) aquatic hazard | Category 1 |
SAFETY DATA SHEET
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tion

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Long-term (chronic) aquatic hazard : Category 1

GHS label elements
Hazard pictograms : ☢ ⚠ Ⓘ ⏐

Signal word : Danger

Hazard statements : H225 Highly flammable liquid and vapour.
                  H303 May be harmful if swallowed.
                  H305 May be harmful if swallowed and enters airways.
                  H319 Causes serious eye irritation.
                  H371 May cause damage to organs.
                  H373 May cause damage to organs through prolonged or re-
                  peated exposure.
                  H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements : Prevention:
                           P210 Keep away from heat/ sparks/ open flames/ hot surfaces.
                           No smoking.
                           P233 Keep container tightly closed.
                           P241 Use explosion-proof electrical/ ventilating/ lighting equip-
                           ment.
                           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.
                           P270 Do not eat, drink or smoke when using this product.
                           P273 Avoid release to the environment.
                           P280 Wear protective gloves/ protective clothing/ eye protec-
                           tion/ face protection.

Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immedi-
ately all contaminated clothing. Rinse skin with water/ shower.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for se-
veral minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P311 IF exposed or concerned: Call a POISON CENTER/ doctor.
P331 Do NOT induce vomiting.
P337 + P313 If eye irritation persists: Get medical advice/ at-
tention.
P391 Collect spillage.

Storage:
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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
Highly flammable liquid and vapour.

Health hazards
May be harmful if swallowed. Causes serious eye irritation. May cause damage to organs. May cause damage to organs through prolonged or repeated exposure. May be harmful 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

Substance / Mixture: Mixture

Components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3-Dioxan-5-ol</td>
<td>4740-78-7</td>
<td>&gt;= 30 -&lt; 50</td>
</tr>
<tr>
<td>Butanone</td>
<td>78-93-3</td>
<td>&gt;= 10 -&lt; 20</td>
</tr>
<tr>
<td>Ivermectin</td>
<td>70288-86-7</td>
<td>&gt;= 1 -&lt; 2.5</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 if symptoms occur.
In case of skin contact: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes.
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: May be harmful if swallowed.
## 4. HAZARDS IDENTIFICATION

**and effects, both acute and delayed**

- May be harmful if swallowed and enters airways.
- Causes serious eye irritation.
- May cause damage to organs.
- 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 firefighting**: Do not use a solid water stream as it may scatter and spread fire.
- 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**: Carbon 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.
- Ventilate the area.
- Use personal protective equipment.
- Follow safe handling advice and personal protective equipment recommendations.

**Environmental precautions**: Discharge into the environment must be avoided.
- 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**: Non-sparking tools should be used.
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7. HANDLING AND STORAGE

Handling

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

Local/Total ventilation : If sufficient ventilation is unavailable, use with local exhaust ventilation. If advised by assessment of the local exposure potential, use only in an area equipped with explosion-proof exhaust ventilation.

Advice on safe handling : Avoid inhalation of vapour or mist. Do not swallow. Do not get in eyes. Avoid prolonged or repeated contact with skin. 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 and sources of ignition. Take precautionary measures against static discharges. Take care to prevent spills, waste and minimize release to the environment.

Avoidance of contact : Oxidizing agents

Storage


Materials to avoid : Do not store with the following product types: Self-reactive substances and mixtures Organic peroxides Oxidizing agents

containment and cleaning up

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.
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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>Butanone</td>
<td>78-93-3</td>
<td>PC-TWA</td>
<td>300 mg/m³</td>
<td>GBZ 2.1-2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PC-STEL</td>
<td>600 mg/m³</td>
<td>GBZ 2.1-2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>200 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>300 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Ivermectin</td>
<td>70288-86-7</td>
<td>TWA</td>
<td>0.05 mg/m³ (OEB 3)</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Further information: Skin</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wipe limit 0.5 mg/100 cm²</td>
<td>Internal</td>
</tr>
</tbody>
</table>

**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>Butanone</td>
<td>78-93-3</td>
<td>methyl ethyl ketone</td>
<td>Urine</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>2 mg/l</td>
<td>ACGIH BEI</td>
</tr>
</tbody>
</table>

**Engineering measures**

- Use appropriate engineering controls and manufacturing technologies to control airborne concentrations (e.g., dripless quick connections).
- All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.
- Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices).
- Minimize open handling.
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#### 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 safety glasses with side shields or goggles. If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles. Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.

**Skin and body protection**: Work uniform or laboratory coat. Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces. Use appropriate degowning techniques to remove potentially contaminated clothing.

**Hand protection**

- **Material**: Chemical-resistant gloves
- **Remarks**: Consider double gloving. Take note that the product is flammable, which may impact the selection of hand protection.

**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. Wash contaminated clothing before re-use. The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

- **Appearance**: liquid
- **Colour**: Colorless to pale yellow
- **Odour**: characteristic
- **Odour Threshold**: No data available
- **pH**: No data available
- **Melting point/freezing point**: < -66 °C
- **Initial boiling point and boiling range**: 81.5 °C
- **Flash point**: 16 °C
Evaporation rate : No data available
Flammability (solid, gas) : Not applicable
Flammability (liquids) : Not applicable
Upper explosion limit / Upper flammability limit : No data available
Lower explosion limit / Lower flammability limit : No data available
Vapour pressure : No data available
Relative vapour density : No data available
Relative density : 1.04 - 1.08
Density : No data available
Solubility(ies)
Water solubility : slightly soluble
Partition coefficient: n-octanol/water : Not applicable
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Viscosity
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
Highly 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
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: 4,167 mg/kg
Method: Calculation method

Acute dermal toxicity: Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Components:
1,3-Dioxan-5-ol:
Acute oral toxicity: LD50 (Rat): > 5,000 mg/kg

Acute dermal toxicity: LD50 (Rat): > 2,000 mg/kg
Remarks: Based on data from similar materials

Butanone:
Acute oral toxicity: LD50 (Rat): > 2,000 - 5,000 mg/kg
Remarks: Based on data from similar materials

Acute inhalation toxicity: LC50 (Rat): > 25.5 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 436
Remarks: Based on data from similar materials

Acute dermal toxicity: LD50 (Rabbit): > 5,000 mg/kg

Ivermectin:
Acute oral toxicity: LD50 (Rat): 50 mg/kg
LD50 (Mouse): 25 mg/kg
LD50 (Monkey): > 24 mg/kg
Target Organs: Central nervous system
Symptoms: Vomiting, Dilatation of the pupil
Remarks: No mortality observed at this dose.

Acute inhalation toxicity: LC50 (Rat): 5.11 mg/l
Exposure time: 1 h
Test atmosphere: dust/mist

Acute dermal toxicity:
- LD50 (Rabbit): 406 mg/kg
- LD50 (Rat): > 660 mg/kg

Skin corrosion/irritation
Not classified based on available information.

Components:

1,3-Dioxan-5-ol:
- Species: Rabbit
- Method: OECD Test Guideline 404
- Result: No skin irritation
- Remarks: Based on data from similar materials

Butanone:
- Assessment: Repeated exposure may cause skin dryness or cracking.
- Species: Rabbit
- Method: OECD Test Guideline 404
- Result: No skin irritation
- Remarks: Based on data from similar materials

Ivermectin:
- Species: Rabbit
- Result: No skin irritation

Serious eye damage/eye irritation
Causes serious eye irritation.

Components:

1,3-Dioxan-5-ol:
- Species: Rabbit
- Result: Irritation to eyes, reversing within 21 days
- Method: OECD Test Guideline 405
- Remarks: Based on data from similar materials

Butanone:
- Species: Rabbit
- Result: Irritation to eyes, reversing within 21 days
- Method: OECD Test Guideline 405

Ivermectin:
- Species: Rabbit
- Result: Mild eye irritation
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Respiratory or skin sensitisation

Skin sensitisation
Not classified based on available information.

Respiratory sensitisation
Not classified based on available information.

Components:

1,3-Dioxan-5-ol:
Test Type: Maximisation Test
Exposure routes: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative
Remarks: Based on data from similar materials

Butanone:
Test Type: Buehler Test
Exposure routes: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Ivermectin:
Exposure routes: Dermal
Species: Humans
Result: Does not cause skin sensitisation.

Germ cell mutagenicity
Not classified based on available information.

Components:

1,3-Dioxan-5-ol:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Result: negative

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

Butanone:
Ivermectin (with Propylene Glycol) Formulation

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: Saccharomyces cerevisiae, gene mutation assay (in vitro)
  Result: negative

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

Ivermectin:
Genotoxicity in vitro:
- Test Type: Bacterial reverse mutation assay (AMES)
  Result: negative
- Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
  Test system: human diploid fibroblasts
  Result: negative
- Test Type: Mouse Lymphoma
  Result: negative

Carcinogenicity
Not classified based on available information.

Components:

Ivermectin:
- Species: Rat
- Application Route: Oral
- NOAEL: 1.5 mg/kg body weight
- Result: negative
- Remarks: Based on data from similar materials

Species: Mouse
- Application Route: Oral
- NOAEL: 2.0 mg/kg body weight
- Result: negative
- Remarks: Based on data from similar materials
Reproductive toxicity
Not classified based on available information.

Components:

Butanone:
Effects on fertility: Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development: Test Type: Embryo-foetal development
Species: Rat
Application Route: Inhalation
Method: OECD Test Guideline 414
Result: negative

Ivermectin:
Effects on fertility: Test Type: Fertility
Species: Rat
Application Route: Oral
Fertility: NOAEL: 0.6 mg/kg body weight
Result: Animal testing did not show any effects on fertility.

Effects on foetal development: Test Type: Development
Species: Mouse
Application Route: Oral
Developmental Toxicity: NOAEL: 0.2 mg/kg body weight
Result: Teratogenic effects, Embryotoxic effects and adverse effects on the offspring were detected only at high maternally toxic doses

Test Type: Development
Species: Rat
Application Route: Oral
Developmental Toxicity: LOAEL: 0.4 mg/kg body weight
Result: Embryotoxic effects and adverse effects on the offspring were detected.
Remarks: The mechanism or mode of action may not be relevant in humans.

Test Type: Development
Species: Rabbit
Application Route: Oral
Result: Teratogenic effects, Embryotoxic effects and adverse effects on the offspring were detected only at high maternally toxic doses
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**STOT - single exposure**

May cause damage to organs.

**Components:**

**Butanone:**

Assessment : May cause drowsiness or dizziness.

**Ivermectin:**

Target Organs : Central nervous system
Assessment : Causes damage to organs.

**STOT - repeated exposure**

May cause damage to organs through prolonged or repeated exposure.

**Components:**

**Ivermectin:**

Target Organs : Central nervous system
Assessment : Causes damage to organs through prolonged or repeated exposure.

**Repeated dose toxicity**

**Components:**

**Butanone:**

Species : Rat
NOAEL : 14.84 mg/l
Application Route : inhalation (vapour)
Exposure time : 90 Days
Method : OECD Test Guideline 413

**Ivermectin:**

Species : Dog
NOAEL : 0.5 mg/kg
LOAEL : 1 mg/kg
Application Route : Oral
Exposure time : 14 Weeks
Target Organs : Central nervous system
Symptoms : Dilatation of the pupil, Tremors, Lack of coordination, anorexia

Species : Monkey
NOAEL : 1.2 mg/kg
Application Route : Oral
Exposure time : 2 Weeks
Remarks : No significant adverse effects were reported

Species : Rat
NOAEL : 0.4 mg/kg
LOAEL : 0.8 mg/kg
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Application Route: Oral
Exposure time: 3 Months
Target Organs: spleen, Bone marrow, Kidney

Aspiration toxicity
May be harmful if swallowed and enters airways.

Components:
Butanone:
The substance or mixture causes concern owing to the assumption that it causes a human aspi-
ration toxicity hazard.

Experience with human exposure

Components:
Ivermectin:
Skin contact: Remarks: Can be absorbed through skin.
Eye contact: Remarks: May irritate eyes.
Ingestion: Symptoms: Drowsiness, Dilatation of the pupil, Tremors, Vom-
iting, anorexia, Lack of coordination

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:
1,3-Dioxan-5-ol:
Toxicity to fish: LL50 (Pimephales promelas (fathead minnow)): > 100 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates: EL50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants: EL50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Remarks: Based on data from similar materials

NOELR (Pseudokirchneriella subcapitata (green algae)): > 1 mg/l
Exposure time: 72 h
Remarks: Based on data from similar materials

Toxicity to microorganisms: EC10: > 1,000 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Based on data from similar materials
Butanone:
Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 2,993 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 308 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants: ErC50 (Pseudokirchneriella subcapitata (green algae)): 2,029 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 1,240 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 201

Ivermectin:
Toxicity to fish: LC50 (Oncorhynchus mykiss (rainbow trout)): 0.003 mg/l
Exposure time: 96 h

LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.0048 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 0.000025 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants: EC50 (Pseudokirchneriella subcapitata (green algae)): > 9.1 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 9.1 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity): 10,000
M-Factor (Chronic aquatic toxicity): 10,000

Persistence and degradability

Components:

1,3-Dioxan-5-ol:
Biodegradability: Result: Inherently biodegradable.
Remarks: Based on data from similar materials
### Butanone:

**Biodegradability**: Result: Readily biodegradable.
- Biodegradation: 98%
- Exposure time: 28 d
- Method: OECD Test Guideline 301D

### Ivermectin:

**Biodegradability**: Result: Not readily biodegradable.
- Biodegradation: 50%
- Exposure time: 240 d

### Bioaccumulative potential

#### Components:

**1,3-Dioxan-5-ol**
- Partition coefficient: n-octanol/water: log Pow: -0.65

**Butanone**
- Partition coefficient: n-octanol/water: log Pow: 0.3

**Ivermectin**
- Bioaccumulation: Bioconcentration factor (BCF): 74
- Partition coefficient: n-octanol/water: log Pow: 3.22

### 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**: Dispose of in accordance with local regulations. 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.
SAFETY DATA SHEET
according to GB/T 16483 and GB/T 17519

Ivermectin (with Propylene Glycol) Formulation

Version 2.1 Revision Date: 2020/03/23 SDS Number: 4710377-00003 Date of last issue: 2019/08/23 Date of first issue: 2019/07/30

UNRTDG
UN number : UN 1193
Proper shipping name : METHYL ETHYL KETONE SOLUTION
Class : 3
Packing group : II
Labels : 3

IATA-DGR
UN/ID No. : UN 1193
Proper shipping name : Ethyl methyl ketone solution
Class : 3
Packing group : II
Labels : Flammable Liquids
Packing instruction (cargo aircraft) : 364
Packing instruction (passenger aircraft) : 353

IMDG-Code
UN number : UN 1193
Proper shipping name : ETHYL METHYL KETONE SOLUTION
(Ivermectin)
Class : 3
Packing group : II
Labels : 3
EmS Code : F-E, S-D
Marine pollutant : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

National Regulations

GB 6944/12268
UN number : UN 1193
Proper shipping name : METHYL ETHYL KETONE SOLUTION
Class : 3
Packing group : II
Labels : 3

Special precautions for user
The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

15. REGULATORY INFORMATION

National regulatory information
Law on the Prevention and Control of Occupational Diseases

Regulations on Safety Management of Hazardous Chemicals
Catalogue of Hazardous Chemicals : Listed
**SAFETY DATA SHEET**

according to GB/T 16483 and GB/T 17519

**Ivermectin (with Propylene Glycol) Formula-**

**Version** 2.1
**Revision Date**: 2020/03/23
**SDS Number**: 4710377-00003
**Date of last issue**: 2019/08/23
**Date of first issue**: 2019/07/30

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

<table>
<thead>
<tr>
<th>No. / Code</th>
<th>Chemical name / Category</th>
<th>Threshold quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>W5.3</td>
<td>Flammable liquids</td>
<td>1,000 t</td>
</tr>
</tbody>
</table>

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)
- **GBZ 2.1-2007**: 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
- **GBZ 2.1-2007 / PC-TWA**: Permissible concentration - time weighted average
- **GBZ 2.1-2007 / PC-STEL**: Permissible concentration - short term exposure limit

- **AICS**: Australian Inventory of Chemical Substances; **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 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; **LDS0**: 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 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**: Organisation for Economic Co-operation and Development; **OECD eChem Portal**: OECD eChem Portal search results; **PC**: Permissible concentration; **PC-TWA**: Permissible concentration - time weighted average; **PC-STEL**: Permissible concentration - short term exposure limit; **TLV**: Threshold Limit Values; **TWA**: Time Weighted Average; **STEL**: Short Term Exposure Limit; **VOC**: Volatile Organic Compound; **WC**: Workplace Concentration; **WCL**: Workplace Concentration Limit; **WCL-C**: Workplace Concentration Limit - Compliant; **WCL-IC**: Workplace Concentration Limit - International Code; **WCL-IEC**: Workplace Concentration Limit - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; **WCL-UN**: Workplace Concentration Limit - United Nations; **WCM**: Workplace Concentration Measurement; **WCM-IC**: Workplace Concentration Measurement - International Code; **WCM-IEC**: Workplace Concentration Measurement - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; **WCM-UN**: Workplace Concentration Measurement - United Nations; **WCM-ISO**: Workplace Concentration Measurement - International Organisation for Standardization; **WCM-UL**: Workplace Concentration Measurement - Underwriters Laboratories; **WCM-NL**: Workplace Concentration Measurement - National Laboratory; **WCM-NL**
SAFETY DATA SHEET
according to GB/T 16483 and GB/T 17519

Ivermectin (with Propylene Glycol) Formula-
tion

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Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumu-
lative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substanc-
es; (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 Tem-
perature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Trans-
portation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - Unit-
ed Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods;
vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials In-
formation System

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, infor-
mation 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 mate-
rial 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 ap-
propriateness of the SDS material in the user's end product, if applicable.

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