SAFETY DATA SHEET

Abamectin Liquid Formulation

Version 3.5
Revision Date: 13.09.2019
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Date of first issue: 18.01.2017

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Abamectin Liquid Formulation

Manufacturer or supplier’s details
Company: MSD
Address: 91-105 Harpin Street
Bendigo 3550, Victoria Australia
Telephone: 908-740-4000
Emergency telephone number: 1 800 033 461
E-mail address: EHSDATASTEWARD@msd.com
Telefax: 1 800 817 414

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

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification
Acute toxicity (Inhalation): Category 4
Specific target organ toxicity - repeated exposure: Category 2 (Central nervous system)

GHS label elements
Hazard pictograms:

Signal word: Warning

Hazard statements:
H332 Harmful if inhaled.
H373 May cause damage to organs (Central nervous system) through prolonged or repeated exposure.

Precautionary statements:
Prevention:
P260 Do not breathe mist or vapours.
P271 Use only outdoors or in a well-ventilated area.

Response:
P304 + P340 + P312 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
P314 Get medical advice/attention if you feel unwell.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards which do not result in classification
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Abamectin (combination of avermectin B1a and avermectin B1b)</td>
</tr>
<tr>
<td>Chemical name</td>
<td>71751-41-2</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>&gt;= 1 - &lt; 3</td>
</tr>
<tr>
<td>Components</td>
<td>&gt;= 60 - &lt;= 100</td>
</tr>
<tr>
<td>Concentration (%) w/w</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 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. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

In case of skin contact: In case of contact, immediately flush skin with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

In case of eye contact: Flush eyes with water as a precaution. Get medical attention if irritation develops and persists.

If swallowed: If swallowed, DO NOT induce vomiting. Get medical attention.

Most important symptoms and effects, both acute and delayed: Harmful if inhaled. 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.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
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Unsuitable extinguishing media: None known.
Specific hazards during firefighting: 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.
Hazchem Code: •3Z

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:
- 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 containment and cleaning up:
- Soak up with inert absorbent material.
- 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.

SECTION 7. HANDLING AND STORAGE

Technical measures:
- See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation:
- If sufficient ventilation is unavailable, use with local exhaust ventilation.
Advice on safe handling:
- Do not breathe vapours or spray mist.
- Do not swallow.
- Avoid contact with 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
Keep container tightly closed.
Take care to prevent spills, waste and minimize release to the environment.

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 decontamination and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

Conditions for safe storage:
Keep in properly labelled containers.
Keep tightly closed.
Keep in a cool, well-ventilated place.
Store in accordance with the particular national regulations.

Materials to avoid:
Do not store with the following product types:
Strong oxidizing agents

SECTION 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>Rape oil</td>
<td>8002-13-9</td>
<td>TWA (Mist)</td>
<td>10 mg/m³</td>
<td>AU OEL</td>
</tr>
<tr>
<td>Abamectin (combination of avermectin B1a and avermectin B1b)</td>
<td>71751-41-2</td>
<td>TWA</td>
<td>30 µg/m³ (OEB 3)</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wipe limit 300 µg/100 cm²</td>
<td>Internal</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.

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:
Hand protection:
Combined particulates and organic vapour type
Material : Chemical-resistant gloves

Remarks : Consider double gloving.
Eye 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.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid
Colour : light yellow
Odour : characteristic
Odour Threshold : No data available
pH : No data available
Melting point/freezing point : No data available
Initial boiling point and boiling range : No data available
Flash point : No data available
Evaporation rate : No data available
Flammability (solid, gas) : Not applicable
Flammability (liquids) : No data available
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 : No data available
Density : 0.90 - 0.94 g/cm³
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Solubility(ies)
- Water solubility: insoluble

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

SECTION 10. STABILITY AND REACTIVITY

Reactivity: Not classified as a reactivity hazard.
Chemical stability: Stable under normal conditions.
Possibility of hazardous reactions: Can react with strong oxidizing agents.
Conditions to avoid: None known.
Incompatible materials: Oxidizing agents
Hazardous decomposition products: No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Exposure routes
- Inhalation
- Skin contact
- Ingestion
- Eye contact

Acute toxicity
Harmful if inhaled.

Product:
- Acute oral toxicity: Acute toxicity estimate: > 2,000 mg/kg
  Method: Calculation method
- Acute inhalation toxicity: Acute toxicity estimate: 2.3 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
  Method: Calculation method
- Acute dermal toxicity: Acute toxicity estimate: > 2,000 mg/kg
  Method: Calculation method
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Components:

Rape oil:
Acute oral toxicity: LD50 (Rat): > 2,000 mg/kg
Acute inhalation toxicity:
  LC50 (Rat): > 3.26 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
  Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity: LD50 (Rat): > 2,000 mg/kg

Abamectin (combination of avermectin B1a and avermectin B1b):
Acute oral toxicity:
  LD50 (Rat): 24 mg/kg
  LD50 (Mouse): 10 mg/kg
  LDLo (Monkey): 24 mg/kg
  Symptoms: Dilatation of the pupil
Acute inhalation toxicity:
  LC50 (Rat): 0.023 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
Acute dermal toxicity:
  LD50 (Rat): 330 mg/kg
  LD50 (Rabbit): 2,000 mg/kg

Skin corrosion/irritation
Not classified based on available information.

Components:

Rape oil:
Species: Rat
Result: No skin irritation

Abamectin (combination of avermectin B1a and avermectin B1b):
Species: Rabbit
Result: No skin irritation

Serious eye damage/eye irritation
Not classified based on available information.

Components:

Rape oil:
Species: Rabbit
Result: No eye irritation
Abamectin (combination of avermectin B1a and avermectin B1b):
Species: Rabbit
Result: Mild eye irritation

Respiratory or skin sensitisation

Skin sensitisation
Not classified based on available information.

Respiratory sensitisation
Not classified based on available information.

Components:

Rape oil:
Exposure routes: Skin contact
Species: Guinea pig
Result: negative

Abamectin (combination of avermectin B1a and avermectin B1b):
Test Type: Maximisation Test
Exposure routes: Skin contact
Result: Not a skin sensitizer.

Chronic toxicity

Germ cell mutagenicity
Not classified based on available information.

Components:

Abamectin (combination of avermectin B1a and avermectin B1b):
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Result: negative

Test Type: Alkaline elution assay
Result: negative

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

Carcinogenicity
Not classified based on available information.
Components:

Abamectin (combination of avermectin B1a and avermectin B1b):

Species : Rat
Application Route : Oral
Exposure time : 105 weeks
Result : negative

Species : Mouse
Application Route : Oral
Exposure time : 93 weeks
Result : negative

Reproductive toxicity
Not classified based on available information.

Components:

Abamectin (combination of avermectin B1a and avermectin B1b):

Effects on fertility : Test Type: Fertility
Species: Rat, male
Application Route: Oral
Result: Effects on fertility

Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Oral
Early Embryonic Development: NOAEL: 0.12 mg/kg body weight
Result: Fetotoxicity

Effects on foetal development : Test Type: Embryo-foetal development
Species: Mouse
Application Route: Oral
General Toxicity Maternal: NOAEL: 0.05 mg/kg body weight
Developmental Toxicity: NOAEL: 0.2 mg/kg body weight
Result: Cleft palate
Remarks: Adverse developmental effects were observed

Test Type: Embryo-foetal development
Species: Rabbit
Application Route: Oral
Developmental Toxicity: LOAEL: 2 mg/kg body weight
Result: Cleft palate, Teratogenic effects, Reduced embryonic survival
Remarks: Adverse developmental effects were observed

Test Type: Development
Species: Rat
Application Route: Oral
Developmental Toxicity: LOAEL: 1.6 mg/kg body weight
Result: Teratogenic effects

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, based on animal experiments., Some evidence of
adverse effects on development, based on animal experiments.

**STOT - single exposure**
Not classified based on available information.

**STOT - repeated exposure**
May cause damage to organs (Central nervous system) through prolonged or repeated exposure.

**Components:**

**Abamectin (combination of avermectin B1a and avermectin B1b):**

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

**Repeated dose toxicity**

**Components:**

**Abamectin (combination of avermectin B1a and avermectin B1b):**

- **Species:** Rat
  - **NOAEL:** 1.5 mg/kg
  - **Application Route:** Oral
  - **Exposure time:** 24 Months
  - **Target Organs:** Central nervous system
  - **Symptoms:** Tremors, ataxia

- **Species:** Mouse
  - **NOAEL:** 4.0 mg/kg
  - **Application Route:** Oral
  - **Exposure time:** 24 Months
  - **Target Organs:** Central nervous system
  - **Symptoms:** Tremors, ataxia

- **Species:** Dog
  - **NOAEL:** 0.25 mg/kg
  - **LOAEL:** 0.5 mg/kg
  - **Application Route:** Oral
  - **Exposure time:** 53 Weeks
  - **Target Organs:** Central nervous system
  - **Symptoms:** Tremors, weight loss
  - **Remarks:** mortality observed

- **Species:** Monkey
  - **NOAEL:** 1.0 mg/kg
  - **Application Route:** Oral
  - **Exposure time:** 14 Weeks
  - **Target Organs:** Central nervous system

**Aspiration toxicity**
Not classified based on available information.
Experience with human exposure

**Components:**

**Abamectin (combination of avermectin B1a and avermectin B1b):**

**Ingestion:** Symptoms: May cause, Tremors, Diarrhoea, central nervous system effects, Salivation, tearing

### SECTION 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

**Components:**

**Rape oil:**

**Toxicity to fish**

- LC50 (Oncorhynchus mykiss (rainbow trout)): > 7.48 mg/l
  - Exposure time: 96 h

**Toxicity to daphnia and other aquatic invertebrates**

- EC50 (Daphnia magna (Water flea)): > 96.7 mg/l
  - Exposure time: 48 h

**Toxicity to algae/aquatic plants**

- EL50 (Desmodesmus subspicatus (green algae)): > 1,000 mg/l
  - Exposure time: 72 h
  - Test substance: Water Accommodated Fraction
  - Method: OECD Test Guideline 201
  - Remarks: Based on data from similar materials

**Abamectin (combination of avermectin B1a and avermectin B1b):**

**Toxicity to fish**

- LC50 (Oncorhynchus mykiss (rainbow trout)): 3.2 µg/l
  - Exposure time: 96 h

  - LC50 (Lepomis macrochirus (Bluegill sunfish)): 9.6 µg/l
    - Exposure time: 96 h

  - LC50 (Ictalurus punctatus (channel catfish)): 24 µg/l
    - Exposure time: 96 h

  - LC50 (Cyprinus carpio (Carp)): 42 µg/l
    - Exposure time: 96 h

  - LC50 (Cyprinodon variegatus (sheepshead minnow)): 15 µg/l
    - Exposure time: 96 h

**Toxicity to daphnia and other aquatic invertebrates**

- EC50 (Americamysis): 0.022 µg/l
  - Exposure time: 96 h

- EC50 (Daphnia magna (Water flea)): 0.34 µg/l
  - Exposure time: 48 h

**Toxicity to algae/aquatic plants**

- EC50 (Pseudokirchneriella subcapitata (green algae)): 100 mg/l
  - Exposure time: 72 h
Toxicity to fish (Chronic toxicity):
- NOEC (Pimephales promelas (fathead minnow)): 0.52 µg/l
  Exposure time: 32 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
- NOEC (Daphnia magna (Water flea)): 0.03 µg/l
  Exposure time: 21 d
- NOEC (Mysidopsis bahia (opossum shrimp)): 0.0035 µg/l
  Exposure time: 28 d

Toxicity to microorganisms:
- EC50: > 1,000 mg/l
  Exposure time: 3 h
  Test Type: Respiration inhibition

Persistence and degradability

Components:

Rape oil:
- Biodegradability: Result: Readily biodegradable.
  Biodegradation: 67 %
  Exposure time: 29 d
  Remarks: Based on data from similar materials

Abamectin (combination of avermectin B1a and avermectin B1b):
- Stability in water: Hydrolysis: 50 %(< 12 h)

Bioaccumulative potential

Components:

Rape oil:
- Partition coefficient: n-octanol/water: log Pow: > 4
  Remarks: Expert judgement

Abamectin (combination of avermectin B1a and avermectin B1b):
- Bioaccumulation: Bioconcentration factor (BCF): 52

Mobility in soil

Components:

Abamectin (combination of avermectin B1a and avermectin B1b):
- Distribution among environmental compartments: log Koc: > 3.6

Other adverse effects
No data available
SECTION 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.
If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG
UN number: UN 3082
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(Abamectin (combination of avermectin B1a and avermectin B1b))
Class: 9
Packing group: III
Labels: 9

IATA-DGR
UN/ID No.: UN 3082
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s.
(Abamectin (combination of avermectin B1a and avermectin B1b))
Class: 9
Packing group: III
Labels: Miscellaneous
Packing instruction (cargo aircraft): 964
Packing instruction (passenger aircraft): 964
Environmentally hazardous: yes

IMDG-Code
UN number: UN 3082
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(Abamectin (combination of avermectin B1a and avermectin B1b))
Class: 9
Packing group: III
Labels: 9
EmS Code: F-A, S-F
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

ADG
UN number: UN 3082
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,
**SECTION 15. REGULATORY INFORMATION**

Safety, health and environmental regulations/legislation specific for the substance or mixture:

Prohibition/Licensing Requirements: There is no applicable prohibition or notification/licensing requirements, including for carcinogens under Commonwealth, State or Territory legislation.

The components of this product are reported in the following inventories:

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

**SECTION 16. OTHER INFORMATION**

Further information

Revision Date: 13.09.2019

Sources of key data used to compile the Safety Data Sheet:


Date format: dd.mm.yyyy

Full text of other abbreviations:

- **AU OEL**: Australia. Workplace Exposure Standards for Airborne Contaminants.
- **AU OEL / TWA**: Exposure standard - time weighted average

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
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AU / EN