MATERIAL SAFETY DATA SHEET

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1、PRODUCT IDENTIFICATION

Product name: EMAMECTIN BENZOATE 1.9% EC
Product class: Insecticide
Chemical family: Emamectin benzoate
Formulation: Emulsifiable Concentrate

2、COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS NO.</th>
<th>Proportions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emamectin benzoate</td>
<td>137512-74-4</td>
<td>19 G/L</td>
</tr>
<tr>
<td>Solvent</td>
<td></td>
<td>To 100%</td>
</tr>
<tr>
<td>Other ingredients</td>
<td></td>
<td>10%</td>
</tr>
</tbody>
</table>

3、HAZARDS IDENTIFICATION

Potential Health Effects: Relevant routes of exposure: Skin, lungs, eyes, ingestion.
Adverse health effects from exposure to product or ingredients of product:
ACUTE:
Moderate toxicity and irritant via ocular, dermal, inhalation, and ingestion routes. Cause substantial but temporary eye injury. May be fatal if swallowed. Prolonged or frequently repeated exposure may cause allergic skin reactions in some individuals.
Early signs of abamectin poisoning include mydriasis (dilated pupils), ataxia (unsteadiness) and muscle tremors.
CHRONIC:
Target organs: skin, eyes and central nervous system.
Medical conditions known to be aggravated: None known.

4、FIRST AID MEASURES

IF POISONING IS SUSPECTED, or any symptoms are serious, immediately contact the poison information centre, doctor or nearest hospital.
Tel the person contacted the complete product name, and the type and amount of exposure. Describe any symptoms, and follow the advice given.

INGESTION:
If victim is fully conscious, give 2-3 glasses of water to dilute, and get immediate medical attention. Induce vomiting as directed by a physician. Never give anything by mouth or induce vomiting in a person who is unconscious or convulsing.

SKIN:
Immediately remove contaminated clothing and wash skin, hair and fingernails thoroughly with soap and water. Obtain medical attention. Wash contaminated clothing before re-use.

EYES:
Immediately rinse eyes with a large amount of running water, holding eyelids apart to rinse the entire surface of the eye and lids. Obtain medical attention.

INHALATION:
Move to fresh air, clean up, and rest. Give artificial respiration if necessary. Contact Poison Centre or physician immediately.

NOTE TO PHYSICIAN:
Toxicity following accidental ingestion of the product can be minimized by inducing vomiting within one half hour of exposure. If toxicity has progressed to cause severe vomiting, the extent of resultant fluid and electrolyte imbalance should be gauged. Appropriate supportive parenteral fluid replacement therapy should be given, along with other required supportive measures (such as maintenance of blood pressure levels) as indicated by clinical signs, symptoms and measurements. In severe cases, observations should continue for at least several days until clinical condition is stable and normal.

Since abamectin is believed to enhance GABA activity in animals, it is probably wise to avoid drugs that enhance GABA activity (barbiturates, benzodiazepines, valproic acid) in patients with potentially toxic abamectin exposure. There is no specific antidote.

5. FIRE-FIGHTING MEASURES

Flash point and method: 143°F
Upper and lower flammable (explosive) limits in air: Lower:1.0%  Upper:8.0%
Autoignition temperature: 559 °F
Hazardous combustion products: Toxic gases including carbon monoxide, carbon dioxide, oxides of nitrogen, and smoke.
Extinguishing media: Dry chemical, foam, carbon dioxide. Firefighters should wear self-contained breathing apparatus and full protective clothing. Evacuate all non-essential personnel and animals. Discharges to the environment are to be controlled as quickly as possible to avoid contamination. Prevent use of buildings, area and equipment until properly decontaminated.

Sensitivity to explosion by mechanical impact: No
Sensitivity to explosion by static discharge: Low

6. ACCIDENTAL RELEASE MEASURES

Procedures for dealing with release or spill: Extinguish cigarettes and other ignition sources. Wear protective clothing (see Section 8). Absorb spill in absorbent material such as pet liter, sweep up and place in an approved chemical container. Clean up residue with towels moistened with methanol. Seal and label the container and handle in an approved manner. Do not allow spilled material to contaminate water supplies. On soils, skim of the upper contaminated layer and collect for disposal. Follow municipal and provincial regulations for spill reporting and disposal.

7. HANDLING AND STORAGE

Handling practices: KEEP OUT OF REACH OF CHILDREN and animals, and away from open flames or other sources of ignition. Avoid contact with eyes, skin or clothing and avoid breathing vapour or spray mist. Wear full protective clothing and equipment (see Section 8). After work, rinse gloves and remove protective equipment, and wash hands before eating, smoking, drinking, or using the toilet. Clean up spilled product immediately, and clean clothes and equipment after use.
Wash contaminated clothing before re-use. Keep product, spray, wash or rinse water, and contaminated materials out of water, and away from access by people, animals and bees. Keep containers closed when not in use. Do not re-enter treated areas until residues have dried.
Appropriate storage practices/requirements: Store in original containers in a well-ventilated, cool, dry, secure area, inaccessible to children and domestic animals.
Store away from heat or flame.
Keep separate from other products. Clean up spilled product immediately.
National Fire Code classification: Class IIIA combustible liquid

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Applicable control measures, including engineering controls:
Ensure work areas have ventilation and procedures sufficient to maintain airborne levels below the TLV. Provide safety showers and eyewash station near workplace. Keep this material out of water.
Personal protective equipment for each exposure route:

INGESTION: Avoid eating, drinking, smoking or cosmetic application in areas where there is a potential for exposure to this material. Always wash thoroughly after handling.

EYES: To avoid eye contact, wear chemical goggles or a full face shield.

SKIN: To avoid skin contact, wear full-length disposable protective clothing (e.g. Tyvek coveralls), waterproof boots, nitrile gloves, and a head covering.

INHALATION: To avoid breathing vapor or mist, wear an approved supplied air respirator or self-contained breathing apparatus.

9、PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Pale yellow-green liquid
Solvent odour: Aromatic odour
Boiling point: Not available
Specific Gravity: About 0.83-0.87kg/l at 77°F(25°C)
Flammability limits: Non-flammable
Solubility in water: Product emulsifies in water
Viscosity: Not available
PH:5.58

10、STABILITY AND REACTIVITY

Chemical stability: Stable
Conditions to avoid: High heat, open flames
Incompatibility with other materials: Strong caustic solutions, strong acid solutions, oxidizing agents
Hazardous decomposition products: None known
Hazardous polymerisation: Will not occur.

11、TOXICOLOGICAL INFORMATION

Information on product:
LD50 (species and route)
ORAL: LD50,Rat 3160 mg/kg (moderately toxic)
DERMAL: Dermal (LD50 Rabbit) >2150 mg/kg body weight
INHALATION: LC50 Rat 9.6 mg/L air (4 hours) (low toxic)
Irritation data
EYE: Moderately irritating (rabbit)
SKIN: Slightly irritating (rabbit)
Results of studies on:
- Sensitisation: not a sensitisier
- Carcinogenicity: None observed
- Reproductive toxicity: Emamectin benzoate is a reproductive toxin in animal studies at doses acutely toxic to the maternal animal.
- Teratogenicity: In a study with mice, Emamectin benzoate was teratogenic (cleft palate) at doses higher than the toxic dose for the maternal animal.
- Mutagenicity: None observed (Ames Test and Micronucleus Test)
- Chronic exposure: Central nervous system effects in animals.
Other materials that show synergistic toxic effects together with the product:
Other: Not available
12. ECOLOGICAL AND ECOTOXICOLOGICAL INFORMATION

Emamectin benzoate is toxic to aquatic organisms and wildlife. It does not biococoncentrate in fish. It is toxic to bees. Emamectin benzoate photo degrades rapidly in the environment and is metabolized in the soil. Its water solubility is limited; it binds to soil tightly and is not taken up from soil to plants.

<table>
<thead>
<tr>
<th>Species</th>
<th>LC50/EC50</th>
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<tbody>
<tr>
<td>Bees</td>
<td>0.0036μg/bee</td>
</tr>
<tr>
<td>Invertebrates (Water Flea)</td>
<td>0.0099ppm</td>
</tr>
<tr>
<td>Fish (Trout)</td>
<td>0.174 ppm</td>
</tr>
<tr>
<td>Fish (Bluegill)</td>
<td>0.18 ppm</td>
</tr>
<tr>
<td>Birds (8-day dietary - Bobwhite Quail)</td>
<td>1318 ppm</td>
</tr>
<tr>
<td>Birds (8-day dietary - Mallard Duck)</td>
<td>570 ppm</td>
</tr>
</tbody>
</table>

13. DISPOSAL CONSIDERATIONS

Waste disposal information: Do not reuse containers. Rinse the emptied container thoroughly and add the rinsings to the mixture in the spray tank. Dispose of product containers, waste containers and residues in accordance with municipal and provincial regulations. Waste shipments must be securely packed, properly labeled, and documented.

14. TRANSPORT INFORMATION

UN NO.: 1993
CLASS NO.3
Pack Group: II

15. REGULATORY INFORMATION

Not Applicable.

16. OTHER INFORMATION

Notice: Portions of the information contained in this Material Safety Data Sheet ("MSDS") is based on information provided by the previous product. The manufacturer takes no responsibility for the accuracy of this information.

THE END OF MSDS