1. PRODUCT AND COMPANY IDENTIFICATION

Avima (Pty) Ltd
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Trade name Methamidophos 585 SL
INSECTICIDE.

Use Systemic insecticide and acaricide
for the control of many insects and
mites as indicated on the label.

2. COMPOSITION / INFORMATION ON INGREDIENTS

Active ingredient Methamidophos
Chemical Name O,S-dimethyl phosphoramidothioate
(IUPAC).
CAS No. 10265-92-6
Chemical family Organophosphate
Chemical formula C8H14NO2PS (Mol. wt.:141.1)
NIOSH/RTECS no. TB497000
UN no. 2784
Hazchem class Division 6.1 Subsidiary 3
Hazardous components Methamidophos 585 g/l plus
Isopropanol
EEC No. 233-606-0
EEC classification T+, N
Risk-Phrases R10, R 24,R26/28-36-50

3. HAZARDS IDENTIFICATION

Toxicity class: WHO Ib; EPA I
Main hazard: Flammable.

Methamidophos is a compound which inhibits cholinesterase
enzyme activity in the nervous tissue. It is of very high
toxicity. Contact with skin, inhalation of dust or spray, or
swallowing may be fatal. Toxic to fish and bees.

Biological hazards: May be absorbed from the gastrointestinal tract, through
the intact skin, and through inhalation of fine spray mist or dust.

Eye contact: Highly toxic. Mildly irritating to eyes.
Skin contact: Highly toxic. Mildly irritating to skin.
Ingestion: Highly toxic by ingestion. See point 4 for symptoms.
Inhalation: Highly toxic by inhalation. See point 4 for symptoms.
Carcinogenicity, Mutagenicity, Neurotoxicity,
Reproductive toxicity: See section 11.

4. FIRST AID MEASURES

Symptoms of exposure to the product include: nausea,
headache, tiredness, giddiness, blurred vision and pupillary
constriction. Depending on severity of poisoning these
symptoms become worse with the onset of vomiting, abdominal
pain, diarrhea, sweating and salivation. Confusion, ataxia,
slurred speech, loss of reflexes are some of the central nervous
system effects may lead to misdiagnosis of acute alcoholism.

Overexposure effects:
After inhalation of vapours or aerosols effects appear within
minutes: ocular and respiratory effects generally appear first.
This includes marked miosis, ocular pain, conjunctival
congestion, diminished vision, ciliary spasm and brow ache.
With acute systemic absorption, miosis may not be evident
due to sympathetic discharge in response to the hypotension. In
addition to rhinorrhea and hyperemia of the upper respiratory
tract, respiratory effects consist of “tightness” in the chest and
wheezing respiration, caused by the combination of broncho-
constriction and increased bronchial secretion. Gastrointestinal
symptoms occur earliest after ingestion, and include anorexia,
nausea and vomiting, abdominal cramps, and diarrhea.

With percutaneous absorption of liquid, localized sweating
and muscular fasciculation in the immediate vicinity are
generally the earliest manifestations.

Severe intoxication is manifested by extreme salivation,
involuntary defecation and urination, sweating, lacrimation,
penile erection, bradycardia and hypotension.
The airway should be kept clear to maintain respiration,
particularly when the patient is unconscious or has vomited.
The mouth and pharynx should be cleared and dentures
removed. The jaw should be supported and the patient placed
in a face down position with the head down and turned to one
side, with the tongue drawn forward. First aid should include,
if necessary, mouth-to-nose respiration, cardiac massage and
avoidance of injury in patients with trauma.

Inhalation:
Remove source of contamination or move victim to fresh air. Keep affected person warm and at rest. Supply oxygen if necessary. Treat symptomatically and supportively. Seek medical advice immediately.

**Skin contact:**
Remove contaminated clothing, shoes and leather goods. Gently wipe of excess chemical. Wash skin gently and thoroughly with water and non-abrasive soap. Seek medical advice if necessary. Persons who become sensitised may require specialised medical management with anti-inflammatory agents.

**Eye contact:**
Immediately flush eyes with gently flowing cold water or saline solution for 15-20 minutes, holding the eyelid(s) open. Seek medical attention immediately.

**Ingestion:**
Have victim rinse mouth thoroughly with water. Do not induce vomiting, due to the aromatic solvent. Seek medical advice immediately.

**Advice to physician:**
Atropine must be administered as early as possible and could save lives, if given in time and in an adequate dosage. Patients with organophosphate poisoning require amounts of atropine far in excess of doses usually employed in medical practice. The therapeutic objective is to achieve atropinisation, as evidenced by dilation of the pupils, drying secretion, pulse rate of over 120/min and flushing skin. To prevent gastrointestinal absorption in the unconscious who have swallowed this product, perform stomach lavage using bicarbonate solution and activated charcoal.

In less severe cases begin with 2 mg atropine intravenously for adults, or 0.05 mg atropine/kg body weight for children under 12 years of age and repeat administration of the drug at 15 - 30 min intervals.

In severe cases a total atropine dose of 20 - 80 mg in the first hour may be necessary, with repeated drug administration at 3-10 min intervals. When signs of atropinisation appear, the dose and frequency of administration should be reduced to a schedule that will maintain full atropinisation for at least 24h. Overdosage with atropine is rarely serious, but underdosage may be fatal in poisoning with organophosphorous compounds. In any severe progressive case of poisoning a cholinesterase reactivator e.g. pralidoxime (2PAM), if available, should be administered, preferably within 8h after intoxication. An average dose is 1 g for an adult (up to 50 mg/kg for children), usually given half as a single intramuscular or intravenous injection and the other half as an intravenous infusion with glucose and or saline. In severe cases this treatment may be repeated in 1 - 2 h, then at 10 - 12 h intervals if needed, but not beyond 24 h, or 48 h at the most. Pralidoxime should be administered very slowly. If respiration is depressed during or after injection, pulmonary ventilation should be assisted mechanically.

Toxogonin is a more recent cholinesterase reactivator. It can be administered instead of 2PAM at a dose of 250 mg intramuscularly for adults (4-8 mg/kg for children) and, if necessary, repeat after 1-2 h. Diazepam should be included in the therapy of severe cases and whenever convulsions appear. Doses of 5-10 mg for adults (2-5 mg for children) can be administered intravenously or subcutaneously or per rectum, and repeated as required.

NB Because of their respiratory-depressant effects, morphine and similar drugs are contraindicated for patients poisoned with organophosphorous compounds. Avoid aminoglycosides and succinylcholine which have a blocking effect on the neuromuscular junction.

Phenothiazines, reserpine and theophylline are contraindicated in organophosphorous poisoning.

## 5. FIRE FIGHTING MEASURES

**Extinguishing agents:**
Extinguish small fires with carbon dioxide, dry chemical, water spray or standard foam. For larger fires, use dry chemical, “alcohol” foam, Halon, or carbon dioxide to fight fire.

**Firefighting:**
Move containers from fire area if possible. Fight fire from maximum distance. Stay away from storage tank ends. Contain fire control water for later disposal. Do not scatter material, extinguish only if flow can be stopped. Use flooding amounts of water as a fog, solid streams may be ineffective. Cool containers with flooding amounts of water as far as distance as possible. Do not get water inside the containers. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Use water spray to absorb toxic vapours. Avoid breathing toxic vapours. Keep upwind. Consider evacuation of downwind area if material is leaking.

**Fire and explosion hazard:**
Flammable. Toxic dust and irritating fumes may be produced during fires.

**Personal protective equipment:**
Fire may produce irritating or poisonous vapours (toxic oxides of nitrogen), mists or other products of combustion. Firefighters and others that may be exposed should wear full protective clothing and self-contained breathing apparatus.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:**
Avoid contact with skin and eyes. Do not breathe in dust or fumes. For personal protection see Section 8.

Environmental precautions:
Do not allow to enter drains or water courses. When the product contaminates public waters, inform appropriate authorities immediately in accordance with local regulations.

Occupational spill:
Small spills: Do not touch spilled material. Stop leak if you can do so without risk. Use water spray to reduce vapours (contain any water used). Neutralise with sodium hydroxide and allow to stand for 4 hours. Sweep up with sand or other suitable absorbent material, such as sawdust, and place into containers for later disposal. Move containers from spill area.

7. HANDLING AND STORAGE

Handling:
Highly toxic by contact with skin, inhalation or if swallowed. Avoid contact with eyes, prolonged contact with skin, and inhalation of dust and vapour. Use with adequate ventilation. Wash hands before eating, drinking, chewing gum, smoking, or using the toilet. Remove clothing immediately if the insecticide gets inside. Then wash skin thoroughly using a non-abrasive soap and put on clean clothing. Do not apply directly to areas where surface water is present, or to intertidal areas below the mean high water mark. Water used to clean equipment must be disposed of correctly to avoid contamination.

Storage:
The product must be kept under lock and key. Keep out of reach of unauthorised persons, children and animals. Store in its original labelled container in shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Not to be stored next to foodstuffs and water supplies. Local regulations should be complied with.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Occupational exposure limits:
NIOSH: Not listed.
RfD: OPP: 0.00100 mg/kg/day; EPA: 0.00005 mg/kg/day; WHO: 0.00400 mg/kg/day
NOEL: 0.03 mg/kg/day (rat feeding study)
LEL: 0.05 mg/kg/day

Engineering control measures:
It is essential to provide adequate ventilation. The measures appropriate for a particular worksite depend on how this material is used and on the extent of exposure. Ensure that control systems are properly designed and maintained. Comply with occupational safety, environmental, fire, and other applicable regulations. If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection.

Personal protective equipment:
Respirator:
An approved respirator suitable for protection from dusts and mists of pesticides is adequate. Limitations of respirator use specified by the approving agency and the manufacturer must be observed.

Clothing:
Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with the substance.

Gloves:
Employee must wear appropriate synthetic protective gloves to prevent contact with this substance.

Eye protection:
The use of full face protection is recommended.

Emergency eye wash: Where there is any possibility that an employee’s eyes may be exposed to this substance, the employer should provide an eye wash fountain or appropriate alternative within the immediate work area for emergency use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:
Clear yellowish liquid

Odour:
Pungent odor.

Explosive properties:
Non explosive.

Oxidising properties:
None.

Corrosiveness:
Slightly corrosive to mild steel and copper alloys.

pH: Not applicable.

Density:
1.12 - 1.15 g/m³ at 20°C.

Solubility in water:
Will mix with water.

Partition-coefficient in n-octanol / water:
log P ow: -0.8

Flashpoint:
<23 °C
10. STABILITY AND REACTIVITY

Stability:
Stable for up to 2 years under normal warehouse conditions.
Stable in weakly acidic media, but hydrolysed by concentrated alkalis. Half-life is 1 year (pH 4), 93 days (pH 7), 30 hours (pH 9) and 40 minutes (pH 10). The rate of decomposition increases at higher temperatures.

Incompatibility:
Spray solutions containing this product should be mixed, stored or applied using stainless steel, aluminium, fibreglass or plastic-lined containers or equipment. Product is relatively stable in weakly acidic media, but rapidly hydrolysed by strong alkalis. Compatible with most insecticides, fungicides and acaricides when used at normal rates. However, a compatibility test is required before using with other products. Do not physically mix concentrate directly with other pesticide concentrates; always dilute first. Mixtures with alkaline substances should be applied immediately after preparation of the spray mixture.

Thermal decomposition:
Toxic oxides of nitrogen and methyl isocyanate are released when the product decomposes on heating.

11. TOXICOLOGICAL INFORMATION

Data based on Active ingredient.

Acute oral LD₅₀:
30 mg/kg in rats.

Acute dermal LD₅₀:
130 mg/Kg

Inhalation LC₅₀:
Rats: >0, 2 mg/ℓ of air over 4 hours (aerosol).

Acute skin irritation:
May cause irritation.

Acute eye irritation:
May cause severe irritation.

Dermal sensitisation:
Considered to be a weak skin sensitizer.

Carcinogenicity:
Animal studies did not detect any carcinogenic activity. No human information available.

Teratogenicity:
No information available.

Mutagenicity:
Weakly mutagenic.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGY:

Birds:
Methamidophos is very toxic to birds. Oral LD50 values were 10-11 mg/kg in tests with bobwhite quail.

Fish LC₅₀(96h):
Rainbow trout: 40 mg/ℓ

Daphnia LC₅₀(48h):
Methamidophos is toxic to aquatic organisms. 0,27 mg/ℓ

Earthworms LC₅₀:
Eisenia foetida: 73 mg/kg dry soil.

Bees:
Toxic to bees.

Algae:
ErC50 (Scenedesmus subspicatus): >178 mg/l.

Degradability:
Most organophosphate pesticides degrade relatively rapidly in the environment. All organophosphate esters undergo hydrolysis in water; generally the water-soluble products of hydrolysis are less toxic than the parent compound.

Degradation is by hydrolysis with loss of the amino, S-methyl or O-methyl groups.

Mobility:
Due to the rapid degradation of the substance, its leaching into deeper soil layers can be ruled out.

Accumulation:
The product shows little or no tendency to bioaccumulate.

13. DISPOSAL CONSIDERATIONS

Pesticide disposal:
Contaminated absorbents, used containers, surplus product, etc., should be burnt at 1000°C in an incinerator, preferably designed for pesticide disposal, or buried in designated landfill. Hydrolysis under alkaline conditions (e.g. sodium hydroxide) is a suitable method to dispose of small quantities of the product. After hydrolysis, dilute and dispose of via the sewage system. Comply with local legislation applying to waste disposal.

Package product wastes:
Emptied containers retain vapour and product residues. Observe all labelled safeguards until container is destroyed. Combustible containers should be disposed of in pesticide incinerators. Metal containers must be crushed and transported to a scrap metal facility for disposal or burial in a designated landfill.

14. TRANSPORT INFORMATION

UN NUMBER: 3017
ADR/IRD  
Shipping name: Organophosphorous pesticide, liquid, flammable, toxic (methamidophos).
Class: 6.1  
Classification code: FT2  
Packaging group: II  
Label: 3 + 6.1  
Hazard ID no. 336

IMDG/IMO  
Shipping name: Organophosphorous pesticide, liquid, flammable, toxic (methamidophos).
Class: 3  
Subsidiary risk: 6.1  
Packaging group: II  
Label: 3 + 6.1
Marine pollutant

AIR/IATA  
Shipping name: Organophosphorous pesticide, liquid, flammable, toxic (methamidophos).
Class: 3  
Subsidiary risk: 6.1  
Label: Flammable liquid & Toxic  
Packaging Group: II  
Passenger Aircraft: 305 (max 1 L)  
Y305 (max 1 L)  
Cargo Aircraft: 307 (max 60 L)  
Tremcard number: 30GFT2-II

15. REGULATORY INFORMATION

Symbol: T +, N, F  
Indication of danger: Very toxic.  
Dangerous for the environment, Flammable  
Risk phrases:  
R10 Flammable  
R24 Toxic in contact with skin.  
R26/28 Very toxic by inhalation and if swallowed.  
R36 Irritating to eyes.  
R50 Very toxic to aquatic organisms.

Safety phrases:  
S1/2 Keep locked up and out of reach children.  
S16 Keep away from sources of ignition.

S28 After contact with skin, wash immediately with plenty soap and water.
S36/37 Wear suitable protective clothing and gloves.  
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).  
S61 Avoid release to the environment. Refer to special instructions/Safety data sheets.


16. OTHER INFORMATION

Compiled by: Danie Fourie  
All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the PRODUCT AS SUCH. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons in receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produces formulation(s) containing this product, it is the recipients sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.

REFERENCES

- Applicable to own physical and chemical studies.
- ECB-ESIS (European chemical Substance Information System).