SUPPLIER: **DOW AGROSCIENCES (PTY) LTD**
Private Bag X 55
Bryanston,
2021.

EMERGENCY TELEPHONE NUMBERS:
SPILLAGES:
Telephone No. (+27) 032 5330716 or
082 887 8079
Fax (+27) 032 5336134

POISONINGS:
National Poison Centre 021-9386084 (office hours).
021-9316129 (after hours).
UOFS Pharmacology/Toxicology information centre:
082 491 0160

1. IDENTIFICATION OF THE SUBSTANCE AND COMPANY

Trade Name: MEVINPHOS 150 EC
INSECTICIDE, ACARICIDE
Active ingredient: Mevinphos (BSI, E-ISO, ESA, F-ISO, JMAF)
Chemical Name: 2-methoxycarbonyl-1-methylvinyl dimethyl phosphate (IUPAC)
CAS No. [26718-65-0]
Chemical Family: Organophosphate
Chemical Formula: $C_7H_{13}O_6P$ (Mol. wt.: 224.1)
NIOSH No. Not available.
UN No. 3017

2. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components: Mevinphos 150 g/l plus xylene
EEC classification: T+
R Phases: R27/28

3. HAZARD IDENTIFICATION

Toxicity class:
WHO Ia; EPA I
ADI 0.0015 mg/kg
NOEL 4 mg/kg (rats) - 2 year
5 mg/kg diet (dogs) - 2 year

Main Hazard:
This compound inhibits cholinesterase enzyme activity in the nervous tissue. It is very toxic. Contact with skin, inhalation of spray, or swallowing may be fatal.
Fire and explosion hazard:
Product is flammable and explosive due to the solvent.
Chemical Hazard:
None known.
Biological Hazard:
Likely routes of exposure: Skin and eye contact, ingestion and inhalation.
Ingestion:
Highly toxic by ingestion. See point 4 symptoms.
Inhalation:
Highly toxic by inhalation depends on volatility of compound. See point 4 for symptoms.
Skin contact:
Highly toxic, due to possible absorption. Irritating to skin.
Eye contact:
Highly toxic. Irritating to eyes
Carcinogenicity:
See section 11.
Mutagenicity:
See section 11.
Neurotoxicity:
See section 11.
Reproductive /Teragenicity:
See section 11.

2. FIRST AID MEASURES AND PRECAUTIONS

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 that 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. These include marked meiosis, ocular pain, conjunctival congestion, diminished vision, ciliary spasm and brow ache. With **acute systemic absorption**, meiosis may not be evident due to systemic absorption, meiosis may not be evident due to sympathetic discharge in response to the hypertension. 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 bronchoconstriction 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 hypotentsion.
The airway should be kept clear to maintain respiration, particularly when the patient is unconsious or has vomited. The mouth and pharynx should be cleared and denatures 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 soluton for 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 administrated 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 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 intravenously 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 administrations 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. pralidoxine (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 pralidoxime injection, pulmonary ventilation should be assisted mechanically.
Toxogonin is a more recent cholinesterase reactivator. It can be administrated instead of 2PAM at a dose of 250 mg intramusculary for adults (4-8 mg/kg for children) and, if necessary, repeated 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 organophosporous 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 powder, or alcohol-resistant foam. Water spray can be used for cooling of unaffected stock, but avoid water coming in contact with the product. Contain water used for fire-fighting for later disposal. Avoid the accumulation of polluted run-off from the site.

Firefighting:
Remove spectators from surrounding area. Remove container from fire area if possible. Fight fire from maximum distance. For massive fire, use unmanned hose holder or monitor nozzles. Contain fire control agents for later disposal. Use a recommended extinguishing agent for the type of surrounding fire. Water can be used to cool unaffected containers but must

be contained for later disposal. Avoid inhaling hazardous vapours. Keep upwind.

Special Hazards:
Fire may produce irritating or poisonous mists or other products of combustion.

Personal protective equipment:
Fire-fighters and others that may be exposed should wear full protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (SPILLAGE)

Personal precautions:
Do not inhale fumes. Ventilate area of spill or leak, especially confined areas. Avoid contact with skin, eyes or clothes. For personal protection see Section 8.

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

Occupational spill:
For **small spills**, soak up sand or suitable non-combustible absorbent material, place into containers for subsequent disposal. Thoroughly wash body areas, which come into contact with the product. Avoid runoff to sewer as it may cause fire/explosion. Do not allow the product to come in contact with water systems. For **large spills** contact the manufacturer. Contain liquid far ahead of spill. Contain spillage and contaminated water for subsequent disposal. Do not flush spilled material into drains. Keep spectators away and upwind.

7. HANDLING AND STORAGE REQUIREMENTS

Handling:
Remove sources of naked flame or sparks. Harmful by inhalation or if swallowed. Avoid contact with eyes and skin and inhalation of fumes. Use with adequate ventilation. Wash hands before eating, drinking, chewing gum, smoking or using the toilet. Operators should change and wash clothing daily. 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:
Store in its original container in isolated, dry, cool (avoid temperatures above 40^0C) and well-ventilated area. Avoid cross contamination with other pesticides and fertilizers. Product hydrolyzed rapidly in aqueous alkaline solutions. Keep under lock and key out of reach of unauthorized persons, children and animals. Store away form incompatible substances. Not to be stored next to foodstuffs and water supplies. Local regulations should be complied with.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Occupational exposure limits:
0.01 PPM (0.1 mg/m^3) OSHA TWA (skin)
0.03PPM (0.3 mg/m^3) OSHA STEL (skin)
0.01 PPM (0.1 mg/m^3) ACGIH TWA (skin)
0.03 PPM (0.3 mg/m^3) ACGIH STEL(skin)

Engineering control measures:
It is essential to provide adequate ventilation. Ensure that control systems are properly designed and maintained. . Only spark –resistant equipment should be used. Comply with occupational safety, environmental, fire and other applicable regulations.

PERSONAL PROTECTIVE EQUIPMENT:
If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal equipment including approved respiratory protection.

Respirator:
An approved full-face respirator suitable for protection from mists of pesticides is required. 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 skin contact with the substance.

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

Eye protection:
Employee must wear splash-proof safety goggles and face-shield to prevent contact with this substance.
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:
Colourless liquid

Flammability:
Flammable

Explosive properties:
No information currently available.

Flash point:
25 ^{o}C

Oxidising properties:
No information currently available.
pH:
No information currently available.
Relative density:
1.24 g/ℓ at 25°C
Persistent foaming:
No information currently available.
Storage stability:
Stable for up to 2 years under normal warehouse and field conditions. Product hydrolyzed rapidly in aqueous alkaline solutions.
Solubility in water:
Immediately forms an emulsion in water.
Solubility in organic solvents:
(All solubility figures for technical material at 25°C)
Readily soluble in most organic solvents (e.g. alcohols, ketones, chlorinated hydrocarbons). Slightly soluble in aliphatic hydrocarbons, petroleum eher, ligroin and carbon disulfide.
Partition-coefficient in n-octanol / water:
K_{ow} ($logP_{ow}$) = 0.127*(data for active substance).*
Melting point:
Not applicable

10. STABILITY AND REACTIVITY

Stability:
The product is stable at room temperature. Product hydrolyzed rapidly in aqueous alkaline solutions.
Incompatibility:
The product is compatible with most other common pesticides but incompatible with alkaline materials such as Bordeaux mixture or Lime Sulphur.
Do not physically mix concentrate directly with other herbicides or pesticide concentrates; always dilute first.
Hazardous decomposition:
Product undergoes decomposition at high temperatures. Avoid heating above ambient temperature. Toxic fumes may be released when the product decomposes on heating.

11. TOXICOLOGICAL INFORMATION

Acute oral LD_{50} :
3 - 12 mg/kg body weight in rats.
Acute dermal LD_{50} :
4 - 90 mg/kg in rabbits.
Acute inhalation LC_{50} (4 h):
0,125 mg/ℓ of air in rats.
Inhalation of the solvents' vapours at high doses have also resulted in an increased incidence of malformations and decreased fetal weight in laboratory animals
Acute skin irritation:
This product is classified as highly toxic and a mild irritant.
Acute eye irritation:
This product is classified as highly toxic and mild irritant for the eyes.
Dermal sensitisation:
This product is a non-sensitising substance to guinea pigs.
Carcinogenicity:
Studies did not detect carcinogenic activity. No human information available.
Teratogenicity / Reproductive hazard:
Studies did not detect any tetragenic effects. No human information available.
Mutagenicity:
Studies indicate that the product display a mutagenic activity.

12. ECOLOGICAL INFORMATION

Degradability: *(Technical material)*
This product is an organophosphate insecticide that is widely applied to soil to control insect pests. The pathway of degradation in soil involves both chemical and microbial processes. Environmental factors can greatly influence the degradation rate in soil; the most important being moisture, pH, organic content, and pesticide formulation.
This product in formulation can be classified as non-persistent
Mobility:
No information currently available.
Accumulation:
No information currently available.
German wgk: 3

ECOTOXICOLOGY:
Birds:
Acute Oral LD_{50}:
Mallard duck: 4,63 mg/kg
Pheasants: 1,37 mg/kg
Fish LC_{50}:
Highly toxic to fish.
Rainbow trout: 0,17 mg/l
Daphnia:
Toxic to *Daphnia magna.*
Bees LD_{50}:
Toxic to bees.
0,027 mg/kg
Earthworms:
No information currently available
Soil micro-organisms:

No information currently available

13. DISPOSAL CONSIDERATION

Pesticide disposal:
Contaminated absorbents, surplus product, etc., should be burned in a high-temperature incinerator (> 1000 ^{o}C) with effluent gas scrubbing. Never pour untreated waste or surplus products into public sewers or where there is any danger of run-off or seepage into water systems. Comply with local legislation applying to waste disposal.
Package product wastes:
Emptied containers retain vapour and product residues. Observe all labeled safeguards until container is destroyed. Combustible containers should be disposed of in pesticide incinerators. Non-combustible containers must be triple rinsed with water and then be punctured and transported to a scrap metal facility for recycling or disposal in approved landfill site. Comply with any local legislation applying to disposal.

14. TRANSPORT INFORMATION

UN NUMBER: 3017
ADR/IRD:
Substance name: Organophosphorus pesticide, liquid, toxic, flammable. (Mevinphos 150 g/kg).
Substance ID NR: 3017
Hazard ID NR: 663
Label: 6.1 + 3
Item no: 72^{o} (a)

AIR/IATA :.
Shipping name: Organophosphorus pesticide, liquid, toxic, flammable. (Mevinphos 150 g/kg).
Class: 6.1
Subsidiary Risk: 3
Hazard Label: Toxic & flammable
Packaging group: I
Passenger aircraft 603 (max 1 L)
Cargo aircraft: 604 (max 30 L)
IMDG/IMO:.
Packaging group: I
Label of class: 6.1 **Marine Pollutant**
Subsidiary Risk: 3
Shipping Name: Organophosphorus pesticide, liquid, toxic, flammable (Mevinphos 150 g/kg).
UK Not available

Tremcard no: 61GTF2-I

15. REGULATORY INFORMATION

Symbol : T+
Indication of danger: Very Toxic.

Risk phrases :
R27/28 Very **t**oxic in contact with skin and if swallowed.
Safety phrases :
S 1/2 Keep locked up and out of reach of children.
S23 Do no breath spray mist or fumes.
S 28 After contact with skin, wash immediately with plenty of water and non-abrasive soap.
S 36/37 Wear suitable protective clothing, and gloves.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
National Legislation:
In accordance with 91/155/EEC Directive and with French standard T 01-102 and the South African Occupational Health and Safety Act, 1993 (Act. No. 85 of 1993).

16. OTHER INFORMATION

Prepared by: Susan Steyn
Approved 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 formulations(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 own physical and chemical studies.

- *The Pesticide Manual*; Eleventh Edition; Editor Clive Tomlin; Crop Protection Publications, 1997.
- *IPCS*; Health and Safety Guide No. 22; World Health Organisation, Geneva, 1990.
- *Agriculture and Public Health*; Guide to the Treatment of Poisoning by Chemicals, 1993.
- *Pharmacological Basics of Therapeutics; International* Edition; Alfred Goodman Gilman, Joel G. Hardman, Lee E. Limbird, Perry B. Molinoff, Raymond W. Ruddon.
- *EuroChem Monitor*; European Community Legislation on the Marketing and Use of Dangerous Substances and Preparations, Volume 1 and 5.
- *Dangerous Goods Regulations*; *IATA* , International Air Transport Association, 41st Edition, Effective 1 January 2000.
- *Guidelines for personal protection when using pesticides in hot climates.* GIFAP, G8/7 5M/989/ENG/QUA.

END OF MSDS.