SAFETY DATA SHEET

Updated on 15/05/2025

1. Material Identification

Product Name : Leptophos
Catalog Number : io-2572
CAS Number : 21609-90-5
Identified uses : Laboratory chemicals, manufacture of chemical compounds
Company : Ionz

>> R&D Use only

2. Hazards Identification

GHS Classification:

Flammable liquid (category 2)
Acute toxicity, oral (Category 3)
Acute toxicity, dermal (Category 3)
Acute toxicity, inhalation (Category 3)
Specific target organ toxicity, single exposure (Category 1)

Pictogram(s)

GHS Hazard Statements

>> H301 (90.8%): Toxic if swallowed [Danger Acute toxicity, oral]

>> H312 (90.8%): Harmful in contact with skin [Warning Acute toxicity, dermal]

>> H370 (100%): Causes damage to organs [Danger Specific target organ toxicity, single exposure]

>> H400 (100%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (100%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P260, P264, P270, P273, P280, P301+P316, P302+P352, P308+P316, P317, P321, P330, P362+P364, P391, P405, and P501

Health Hazards:

>> This material is highly toxic; it is capable of causing death or permanent injury by exposure during normal use. (EPA, 1998)

>> (Non-Specific -- Organophosphorus Pesticide, n.o.s.) Container may explode in heat of fire. Fire may produce irritating or poisonous gases. Decomposes above 356F. Avoid strong alkalies. (EPA, 1998)

3. Composition/Information On Ingredients

Chemical name : Leptophos
CAS Number : 21609-90-5
Molecular Formula : C13H10BrCl2O2PS
Molecular Weight : 412.1000 g/mol

4. First Aid Measures

First Aid:

>> Warning: Effects may be delayed up to 12 hours. Caution is advised.

>> Note: Leptophos is a cholinesterase inhibitor.

>> Signs and Symptoms of Leptophos Exposure: Acute exposure to leptophos may produce the following signs and symptoms: sweating, pinpoint pupils, blurred vision, headache, dizziness, profound weakness, muscle spasms, seizures, and coma. Mental confusion and psychosis may occur. Excessive salivation, nausea, vomiting, anorexia, diarrhea, and abdominal pain may also occur. The heart rate may decrease following oral exposure or increase following dermal exposure. Chest pain may be noted. Hypotension (low blood pressure) may be observed, although hypertension (high blood pressure) is not uncommon. Respiratory symptoms include dyspnea (shortness of breath), pulmonary edema, respiratory depression, and respiratory paralysis.

>> Emergency Life-Support Procedures: Acute exposure to leptophos exposure may require decontamination and life support for the victims. Emergency personnel should wear protective clothing appropriate to the type and degree of contamination. Air-purifying or supplied-air respiratory equipment should also be worn, as necessary. Rescue vehicles should carry supplies such as plastic sheeting and disposable plastic bags to assist in preventing spread of contamination.

>> Inhalation Exposure:

>> 1. Move victims to fresh air. Emergency personnel should avoid self-exposure to leptophos.

>> 2. Evaluate vital signs including pulse and respiratory rate, and note any trauma. If no pulse is detected, provide CPR. If not breathing, provide artificial respiration. If breathing is labored, administer 100% humidified oxygen or other respiratory support.

>> 3. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 4. Transport to a health care facility.

>> Dermal/Eye Exposure:

>> 1. Remove victims from exposure. Emergency personnel should avoid self-exposure to leptophos.

>> 3. Remove contaminated clothing as soon as possible.

>> 4. If eye exposure has occurred, eyes must be flushed with lukewarm water for at least 15 minutes.

>> 5. Wash exposed skin areas three times with soap and water.

>> 6. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 7. Transport to a health care facility.

>> Ingestion Exposure:

>> 1. Evaluate vital signs including pulse and respiratory rate, and note any trauma. If no pulse is detected, provide CPR. If not breathing, provide artificial respiration. If breathing is labored, administer 100% humidified oxygen or other respiratory support.

>> 2. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 3. Vomiting may be induced with syrup of Ipecac. If elapsed time since ingestion of leptophos is unknown or suspected to be greater than 30 minutes, do not induce vomiting and proceed to Step

>> 4. Ipecac should not be administered to children under 6 months of age.Warning: Ingestion of leptophos may result in sudden onset of seizures or loss of consciousness. Syrup of Ipecac should be administered only if victims are alert, have an active gag-reflex, and show no signs of impending seizure or coma. If ANY uncertainty exists, proceed to Step

>> 4.The following dosages of Ipecac are recommended: children up to 1 year old, 10 mL (1/3 oz); children 1 to 12 years old, 15 mL (1/2 oz); adults, 30 mL (1 oz). Ambulate (walk) the victims and give large quantities of water. If vomiting has not occurred after 15 minutes, Ipecac may be readministered. Continue to ambulate and give water to the victims. If vomiting has not occurred within 15 minutes after second administration of Ipecac, administer activated charcoal.

>> 4. Activated charcoal may be administered if victims are conscious and alert. Use 15 to 30 g (1/2 to 1 oz) for children, 50 to 100 g (1-3/4 to 3-1/2 oz) for adults, with 125 to 250 mL (1/2 to 1 cup) of water.

>> 5. Promote excretion by administering a saline cathartic or sorbitol to conscious and alert victims. Children require 15 to 30 g (1/2 to 1 oz) of cathartic; 50 to 100 g (1-3/4 to 3- 1/2 oz) is recommended for adults.

>> 6. Transport to a health care facility. (EPA, 1998)

5. Fire Fighting Measures

>> (Non-Specific -- Organophosphorus Pesticide, n.o.s.) Stay upwind; keep out of low areas. Move container from fire area if you can do it without risk. Fight fire from maximum distance. Dike fire control water for later disposal; do not scatter the material.

>> (Non-Specific -- Organophosphorus Pesticide, n.o.s.) This material may burn, but does not ignite readily. For small fires, use dry chemical, carbon dioxide, water spray, or foam. For large fires, use water spray, fog, or foam. (EPA, 1998)

6. Accidental Release Measures

Isolation and Evacuation:

Isolation and evacuation measures to take when a large amount of this chemical is accidentally released in an emergency.

>> Excerpt from ERG Guide 151 [Substances - Toxic (Non-Combustible)]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

>> SPILL: Increase the immediate precautionary measure distance, in the downwind direction, as necessary.

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2024)

7. Handling And Storage

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8. Exposure Control/ Personal Protection

Exposure Control and Personal Protection

Exposure Summary

>> Biological Exposure Indices (BEI) [ACGIH] - Acetylcholinesterase activity in red blood cells = 70% of individual's baseline; Butylcholinesterase activity in serum or plasma = 60% of individual's baseline; Sample at end of shift; [TLVs and BEIs]

9. Physical And Chemical Properties

Molecular Weight:

>> 412.1

Exact Mass:

>> 409.86996

Physical Description:

>> Leptophos appears as white crystalline or colorless amorphous solid, the technical product is a light tan powder. Used as an insecticide; its use is not permitted in the U.S. (EPA, 1998)

Color/Form:

>> WHITE CRYSTALLINE SOLID

Melting Point:

>> 158 to 159 °F (EPA, 1998)

Solubility:

>> SOL IN XYLENE

Density:

>> 1.53 at 77 °F (EPA, 1998) - Denser than water; will sink

Vapor Pressure:

>> 0.00000002 [mmHg]

Stability/Shelf Life:

>> STABLE @ NORMAL TEMPERATURES

Decomposition:

>> When heated to decomposition it emits toxic fumes of /sulfur oxides, phosphorus oxides, hydrogen bromide, and hydrogen chloride/.

Collision Cross Section:

Collision cross section (CCS) represents the effective area for the interaction between an individual ion and the neutral gas through which it is traveling (e.g., in ion mobility spectrometry (IMS) experiments). It quantifies the probability of a collision taking place between two or more particles.

>> 169.83 Å² [M+H]+

10. Stability And Reactivity

>> No rapid reaction with air. No rapid reaction with water.

11. Toxicological Information

Adverse Effects:

An adverse effect is an undesired harmful effect resulting from a medical treatment or other intervention.

>> Neurotoxin - Predominantly motor

>> Other Poison - Organophosphate

Antidote and Emergency Treatment:

>> 1. INSURE THAT A CLEAR AIRWAY EXISTS BY ASPIRATION OF SECRETIONS IF NECESSARY. ADMIN OXYGEN BY MECHANICALLY ASSISTED PULMONARY VENTILATION IF RESPIRATION IS DEPRESSED. IMPROVE TISSUE OXYGENATION AS MUCH AS POSSIBLE BEFORE ADMIN ATROPINE TO MINIMIZE RISK OF VENTRICULAR FIBRILLATION. IN SEVERE POISONINGS, IT MAY BE NECESSARY TO SUPPORT PULMONARY VENTILATION MECHANICALLY FOR SEVERAL DAYS. 2. ADMIN ATROPINE SULFATE IV, OR IM IF IV INJECTION IS NOT POSSIBLE. ... IN MODERATELY SEVERE POISONING: ADULT DOSAGE AND CHILDREN OVER 12 YR: 0.4-2.0 MG REPEATED EVERY 15 MIN UNTIL ATROPINIZATION IS ACHIEVED. MAINTAIN ATROPINIZATION WITH REPEATED DOSAGE OF 0.02-0.05 MG/KG BODY WEIGHT. /ORGANOPHOSPHATE PESTICIDES/

Human Toxicity Excerpts:

>> LEPTOPHOS HAS BEEN IMPLICATED IN POISONING & PARALYSIS OF SOME WORKERS IN TEXAS FACTORY WHERE IT WAS MANUFACTURED.

Non-Human Toxicity Excerpts:

>> AFTER A SINGLE ORAL DOSE OF 200 MG/KG IN 20 CHICKENS, LEPTOPHOS PRODUCED DEGENERATION OF SPINAL CORD, ATAXIA (PROBABLY DUE TO POSTERIOR & LATERAL COLUMN INVOLVEMENT), & PARALYSIS WHICH CORRELATED ROUGHLY WITH ANTERIOR DESCENDING TRACT OF SPINAL CORD & PERIPHERAL NERVE DEGENERATION.

Non-Human Toxicity Values:

>> LD50 Rat male oral 52.8 mg/kg

12. Ecological Information

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> Soils were collected in 1976 from 28 farms located in six widely separated areas of southwestern Ontario(1); leptophos was detected (detection limit of 0.02 ppm) in 6 soils at concns ranging from 0.03 to 0.30 ppm(1).

Average Daily Intake:

The average amount of the compound taken into the body through eating, drinking, or breathing.

>> Based upon monitoring results from the US Food and Drug Administration's Total Diet Study (Market Basket Survey) for fiscal years 1976 and 1977, the average daily intake of leptophos from food for the adult male has been estimated to be 0.0005 and 0.0015 ug/kg body weight/day(1).

13. Disposal Considerations

Disposal Methods

>> Potential candidate for rotary kiln incineration, with a temperature range of 820 to 1,600 °C and a residence time of seconds. Also, a potential candidate for fluidized bed incineration, with a temperature range of 450 to 980 °C, and a residence time of seconds. Also, a potential candidate for liquid injection incineration with a temperature range of 650 to 1,600 °C, and a residence time of 0.1 to 2 seconds. /Parathion/

>> The following wastewater treatment technologies have been investigated for parathion: Reverse osmosis. /Parathion/

14. Transport Information

DOT

Leptophos

IATA

Leptophos

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15. Regulatory Information

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16. Other Information

Other Safety Information

Chemical Assessment

>> IMAP assessments - Phosphonothioic acid, phenyl-, O-(4-bromo-2,5-dichlorophenyl) O-methyl ester: Environment tier I assessment

>> IMAP assessments - Phosphonothioic acid, phenyl-, O-(4-bromo-2,5-dichlorophenyl) O-methyl ester: Human health tier I assessment

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