SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : S-Ethyl dipropylthiocarbamate
Catalog Number : io-2359
CAS Number : 759-94-4
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)

>> Warning

GHS Hazard Statements

>> H302 (100%): Harmful if swallowed [Warning Acute toxicity, oral]

Precautionary Statement Codes

>> P264, P270, P301+P317, P330, and P501

Health Hazards:

>> SYMPTOMS: Symptoms of exposure to this compound may include headache, giddiness, nervousness, blurred vision, weakness, nausea, cramps, diarrhea, sweating, miosis, tearing, salivation, vomiting and cyanosis. (NTP, 1992)

>> Flash point data are not available for this chemical, but it is probably combustible. (NTP, 1992)

>> Combustible. Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire.

3. Composition/Information On Ingredients

Chemical name : S-Ethyl dipropylthiocarbamate
CAS Number : 759-94-4
Molecular Formula : C9H19NOS
Molecular Weight : 189.3200 g/mol

4. First Aid Measures

First Aid:

>> EYES: First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

>> SKIN: IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water. IMMEDIATELY call a hospital or poison control center even if no symptoms (such as redness or irritation) develop. IMMEDIATELY transport the victim to a hospital for treatment after washing the affected areas.

>> INHALATION: IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. IMMEDIATELY call a physician and be prepared to transport the victim to a hospital even if no symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Protective Clothing.

>> INGESTION: DO NOT INDUCE VOMITING. If the victim is conscious and not convulsing, administer a slurry of activated charcoal in water and simultaneously call a hospital or poison control center. IMMEDIATELY transport the victim to a hospital. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital. (NTP, 1992)

First Aid Measures

Inhalation First Aid

>> Fresh air, rest. Seek medical attention if you feel unwell.

Skin First Aid

>> Remove contaminated clothes. Rinse and then wash skin with water and soap. Seek medical attention if you feel unwell.

Eye First Aid

>> Rinse with plenty of water (remove contact lenses if easily possible). Refer for medical attention if irritation persists.

Ingestion First Aid

>> Rinse mouth. Seek medical attention if you feel unwell.

5. Fire Fighting Measures

>> Fires involving this compound should be controlled with a dry chemical, carbon dioxide or Halon extinguisher. (NTP, 1992)

>> Use water spray, foam, powder, carbon dioxide.

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)

Spillage Disposal:

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Personal protection: complete protective clothing, protective gloves, safety goggles and filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

7. Handling And Storage

Safe Storage:

>> Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs.

Storage Conditions:

>> ... Indefinite storage life under normal ambient conditions.

8. Exposure Control/ Personal Protection

Inhalation Risk:

>> A harmful contamination of the air will not or will only very slowly be reached on evaporation of this substance at 20 °C; on spraying or dispersing, however, much faster.

Fire Prevention

>> NO open flames.

Exposure Prevention

>> PREVENT GENERATION OF MISTS!

Inhalation Prevention

>> Use ventilation or local exhaust.

Skin Prevention

>> Protective gloves. Protective clothing.

Eye Prevention

>> Wear safety goggles or face shield.

Ingestion Prevention

>> Do not eat, drink, or smoke during work.

9. Physical And Chemical Properties

Molecular Weight:

>> 189.32

Exact Mass:

>> 189.11873540

Physical Description:

>> Ethyl dipropylthiocarbamate appears as clear yellow or light yellow liquid. (NTP, 1992)

>> COLOURLESS LIQUID WITH CHARACTERISTIC ODOUR.

Color/Form:

>> Colorless liquid

Odor:

>> Aromatic odor

Boiling Point:

>> 261 °F at 20 mmHg (NTP, 1992)

>> 232 °C

Flash Point:

>> 116 °C (OPEN CUP)

>> 116 °C o.c.

Solubility:

>> less than 0.1 mg/mL at 72.5 °F (NTP, 1992)

>> Solubility in water, mg/l at 25 °C: 344 (very slightly soluble)

Density:

>> 0.955 (NTP, 1992) - Less dense than water; will float

>> Relative density (water = 1): 0.95

Vapor Density:

>> Relative vapor density (air = 1): 6.5

Vapor Pressure:

>> 0.034 mmHg at 95 °F (NTP, 1992)

>> Vapor pressure, Pa at 25 °C: 3.2

LogP:

>> log Kow = 3.21

>> 3.20

Stability/Shelf Life:

>> Stable under storage conditions.

Autoignition Temperature:

>> 260 °C

Decomposition:

>> When heated to decomposition it emits very toxic fumes of /nitrogen oxides and sulfur oxides/.

Viscosity:

>> 5.20 mm^2/s at 20 °C

Corrosivity:

The ability of a chemical to damage or destroy other substances when it comes into contact.

>> NON-CORROSIVE

Refractive Index:

>> INDEX OF REFRACTION: 1.4750 @ 30 °C/D

10. Stability And Reactivity

>> Water insoluble. Slowly decomposes in water to form carbon disulfide and propyl amine. Such decompositions are accelerated by acids.

11. Toxicological Information

Toxicity Summary:

>> Some thiocarbamates (EPTC, Molinate, Pebulate, and Cycloate) share a common mechanism of toxicity, i.e. the inhibition of acetylcholinesterase. An acetylcholinesterase inhibitor suppresses the action of acetylcholine esterase.

Because of its essential function, chemicals that interfere with the action of acetylcholine esterase are potent neurotoxins, causing excessive salivation and eye-watering in low doses. Headache, salivation, nausea, vomiting, abdominal pain and diarrhea are often prominent at higher levels of exposure. Acetylcholine esterase breaks down the neurotransmitter acetylcholine, which is released at nerve and muscle junctions, in order to allow the muscle or organ to relax. The result of acetylcholine esterase inhibition is that acetylcholine builds up and continues to act so that any nerve impulses are continually transmitted and muscle contractions do not stop.

EPA Human Health Benchmarks for Pesticides:

This section provides the EPA human health benchmarks non-enforceable drinking water levels related to adverse health effects from drinking water exposure to contaminants that have no drinking water standards or health advisories.

Chemical Substance

>> EPTC (Ethyl dipropylthiocarbamate)

Acute or One Day PAD (RfD) [mg/kg/day]

>> 0.2

Acute or One Day HHBPs [ppb]

>> 1000

Acute HHBP Sensitive Lifestage/Population

>> Children

Chronic or One Day PAD (RfD) [mg/kg/day]

>> 0.05

Chronic or One Day HHBPs [ppb]

>> 300

Chronic HHBP Sensitive Lifestage/Population

>> General Population

Reference (PDF)

>> Human Health Benchmarks for Pesticides - 2021 Update

USGS Health-Based Screening Levels for Evaluating Water-Quality:

This section provides the USGS Health-Based Screening Levels for Evaluating Water-Quality data.

Chemical

>> EPTC

USGS Parameter Code

>> 65080

Chronic Noncancer HHBP (Human Health Benchmarks for Pesticides)[µg/L]

>> 300

Benchmark Remarks

>> Listed as EPTC (Ethyl dipropylthiocarbamate)

Reference

>> Smith, C.D. and Nowell, L.H., 2024. Health-Based Screening Levels for evaluating water-quality data (3rd ed.). DOI:10.5066/F71C1TWP

Evidence for Carcinogenicity:

Evidence that this chemical does or may cause cancer. The information here is collected from various sources by the Hazardous Substances Data Bank (HSDB).

>> Cancer Classification: Not Likely to be Carcinogenic to Humans

Carcinogen Classification:

This section provides the International Agency for Research on Cancer (IARC) Carcinogenic Classification and related monograph links. In the IARC Carcinogenic classification, chemicals are categorized into four groups: Group 1 (carcinogenic to humans), Group 2A (probably carcinogenic to humans), Group 2B (possibly carcinogenic to humans), and Group 3 (not classifiable as to its carcinogenicity to humans).

>> No indication of carcinogenicity to humans (not listed by IARC).

Health Effects:

>> Data concerning the effects of thiocarbamates on man are scarce. However, cases of irritation and sensitization have been observed among agricultural workers. Some thiocarbamates, e.g., molinate, have an effect on sperm morphology and, consequently, on reproduction. However, no teratogenic effects have been observed. EPTC was not mutagenic when tested in a series of assays with microbial and human cell culture lines. The results of mutagenicity studies have shown that thiocarbamates containing dichloroallyl groups are highly mutagenic. Some thiocarbamates are acetylcholine esterase inhibitors. Acute exposure to cholinesterase inhibitors can cause a cholinergic crisis characterized by severe nausea/vomiting, salivation, sweating, bradycardia, hypotension, collapse, and convulsions. Increasing muscle weakness is a possibility and may result in death if respiratory muscles are involved.

Exposure Routes:

>> The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

>> Inhalation (L793) ; oral (L793); dermal (L793)

Eye Exposure

>> See Inhalation.

>> As with organophosphates, the signs and symptoms are based on excessive cholinergic stimulation. Unlike organophosphate poisoning, carbamate poisonings tend to be of shorter duration because the inhibition of nervous tissue acetylcholinesterase is reversible, and carbamates are more rapidly metabolized. Muscle weakness, dizziness, sweating and slight body discomfort are commonly reported early symptoms. Headache, salivation, nausea, vomiting, abdominal pain and diarrhea are often prominent at higher levels of exposure. Contraction of the pupils with blurred vision, incoordination, muscle twitching and slurred speech have been reported. (L795)

Target Organs:

Organs that are affected by exposure to this chemical. Information in this section reflects human data unless otherwise noted.

>> Cardiovascular

Adverse Effects:

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

>> Neurotoxin - Other CNS neurotoxin

Toxicity Data:

>> LCLo (rat) = 200 mg/m3/4hr

Treatment:

Treatment when exposed to toxin

>> Treatment of carbamate poisoning is similar to that of organophosphate poisoning in that atropine sulfate injections readily reverse the effects. For acute exposures and first aid: EYES: irrigate opened eyes for several minutes under running water. INGESTION: do not induce vomiting. Rinse mouth with water (never give anything by mouth to an unconscious person). Seek immediate medical advice. SKIN: should be treated immediately by rinsing the affected parts in cold running water for at least 15 minutes, followed by thorough washing with soap and water. If necessary, the person should shower and change contaminated clothing and shoes, and then must seek medical attention. INHALATION: supply fresh air. If required provide artificial respiration.

Interactions:

>> ANTAGONISTIC INTERACTION BETWEEN 2,4-D ([2,4-DICHLOROPHENOXY]ACETIC ACID) & EPTC OR OTHER THIOCARBAMATES HAS BEEN REPORTED ... . GENERALLY, THE INHIBITION OF GROWTH IS RELATED TO THE CONCN OF THIOCARBAMATES, & THIS INHIBITION CAN BE REVERSED BY 2,4-D.

Non-Human Toxicity Excerpts:

>> RATS FED 326 MG/KG DAILY FOR 21 DAYS SHOWED NO SYMPTOMS OTHER THAN EXCITABILITY & WEIGHT LOSS.

Non-Human Toxicity Values:

>> LD50 Rat male albino oral 2550 mg/kg

12. Ecological Information

Resident Soil (mg/kg)

>> 3.90e+03

Industrial Soil (mg/kg)

>> 5.80e+04

Tapwater (ug/L)

>> 7.50e+02

MCL (ug/L)

>> 2.00e+01

Risk-based SSL (mg/kg)

>> 4.00e-01

Chronic Oral Reference Dose (mg/kg-day)

>> 5.00e-02

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

ICSC Environmental Data:

>> The substance is toxic to aquatic organisms. This substance does enter the environment under normal use. Great care, however, should be taken to avoid any additional release, for example through inappropriate disposal.

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> LOSSES OF SOIL APPLIED EPTC FROM SOIL WERE INCR BY AIR MOVEMENT OVER THE SOIL SURFACE. SOIL COMPOSITION & HERBICIDE FORMULATION ALSO INFLUENCED ITS RATE OF LOSS.

13. Disposal Considerations

Spillage Disposal

>> Personal protection: complete protective clothing, protective gloves, safety goggles and filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Disposal Methods

>> SRP: At the time of review, criteria for land treatment or burial (sanitary landfill) disposal practices are subject to significant revision. Prior to implementing land disposal of waste residue (including waste sludge), consult with environmental regulatory agencies for guidance on acceptable disposal practices.

>> EPTC is combustible and could be incinerated. Recommendable method: Incineration. Peer-review: Incineration in a unit with effluent gas scrubbing is recommendable for large amt. (Peer-review conclusions of an IRPTC expert consultation (May 1985))

>> No acceptable chemical detoxification is available. Empty containers should be triple rinsed. "Triple rinse" means the flushing of containers three times, each time using a volume of the normal diluent equal to approx ten percent of the container's capacity, and adding the rinse liquid to the spray mixture or disposing of it by a method prescribed for disposing of the pesticide.

14. Transport Information

DOT

S-Ethyl dipropylthiocarbamate
6.1

UN Pack Group: III

IATA

S-Ethyl dipropylthiocarbamate
6.1,
UN Pack Group: III

15. Regulatory Information

Regulatory Information

REACH Registered Substance

>> Status: Active Update: 25-04-2021 https://echa.europa.eu/registration-dossier/-/registered-dossier/12507

16. Other Information

Other Safety Information

Chemical Assessment

>> IMAP assessments - Carbamothioic acid, dipropyl-, S-ethyl ester: Environment tier I assessment

>> IMAP assessments - Carbamothioic acid, dipropyl-, S-ethyl ester: Human health tier I assessment

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