SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Phenothrin
Catalog Number : io-2832
CAS Number : 26002-80-2
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)

Note

>> Pictograms displayed are for 97.5% (306 of 314) of reports that indicate hazard statements. This chemical does not meet GHS hazard criteria for 2.5% (8 of 314) of reports.

Pictogram(s)

>> Warning

GHS Hazard Statements

>> H302 (63.7%): Harmful if swallowed [Warning Acute toxicity, oral]

>> H312 (63.7%): Harmful in contact with skin [Warning Acute toxicity, dermal]

>> H332 (63.4%): Harmful if inhaled [Warning Acute toxicity, inhalation]

>> H400 (97.1%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (97.5%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P261, P264, P270, P271, P273, P280, P301+P317, P302+P352, P304+P340, P317, P321, P330, P362+P364, P391, and P501

Health Hazards:

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> Inhalation of material may be harmful. Contact may cause burns to skin and eyes. Inhalation of Asbestos dust may have a damaging effect on the lungs. Fire may produce irritating, corrosive and/or toxic gases. Some liquids produce vapors that may cause dizziness or asphyxiation. Runoff from fire control or dilution water may cause environmental contamination. (ERG, 2024)

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> Some may burn but none ignite readily. Containers may explode when heated. Some may be transported hot. For UN3508, Capacitor, asymmetric, be aware of possible short circuiting as this product is transported in a charged state. Polymeric beads, expandable (UN2211) may evolve flammable vapours. (ERG, 2024)

>> Combustible. Liquid formulations containing organic solvents may be flammable.

3. Composition/Information On Ingredients

Chemical name : Phenothrin
CAS Number : 26002-80-2
Molecular Formula : C23H26O3
Molecular Weight : 350.4000 g/mol

4. First Aid Measures

First Aid:

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> Refer to the "General First Aid" section. (ERG, 2024)

First Aid Measures

Inhalation First Aid

>> Fresh air, rest.

Skin First Aid

>> Remove contaminated clothes. Rinse and then wash skin with water and soap.

Eye First Aid

>> First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Ingestion First Aid

>> Rinse mouth.

5. Fire Fighting Measures

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> CAUTION: Fire involving Safety devices (UN3268) and Fire suppressant dispersing devices (UN3559) may have a delayed activation and a risk of hazardous projectiles. Extinguish the fire at a safe distance.

>> SMALL FIRE: Dry chemical, CO2, water spray or regular foam.

>> LARGE FIRE: Water spray, fog or regular foam. Do not scatter spilled material with high-pressure water streams. If it can be done safely, move undamaged containers away from the area around the fire. Dike runoff from fire control for later disposal.

>> FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks in direct contact with flames. (ERG, 2024)

>> Use powder, AFFF, foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

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 171 [Substances (Low to Moderate Hazard)]:

>> 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.

>> Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in sealable containers as far as possible. 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. Keep in a well-ventilated room.

Storage Conditions:

>> Ventilate well. Store in closed drum in cool, dry place.

8. Exposure Control/ Personal Protection

Inhalation Risk:

>> No indication can be given about the rate at which a harmful concentration of this substance in the air is reached on evaporation at 20 °C.

Effects of Short Term Exposure:

>> The substance is irritating to the eyes.

Acceptable Daily Intakes:

An estimate of the amount of a chemical in food or drinking water that can be consumed daily over a lifetime without presenting an appreciable risk to health. It is usually expressed as milligrams of the substance per kilogram of body weight per day and applies to chemicals such as food additives, pesticide residues and veterinary drugs.

>> FAO/WHO ADI: 0.07 mg/kg

Fire Prevention

>> NO open flames.

Exposure Prevention

>> PREVENT GENERATION OF MISTS!

Inhalation Prevention

>> Use ventilation, local exhaust or breathing protection.

Skin Prevention

>> Protective gloves.

Eye Prevention

>> Wear safety goggles.

Ingestion Prevention

>> Do not eat, drink, or smoke during work. Wash hands before eating.

9. Physical And Chemical Properties

Molecular Weight:

>> 350.4

Exact Mass:

>> 350.18819469

Physical Description:

>> Phenothrin is a pale yellow to yellow-brown liquid. Non corrosive. Used as an insecticide.

>> PALE YELLOW-TO-YELLOW-BROWN LIQUID.

Color/Form:

>> Colorless liquid

Odor:

>> Faint characteristic odor

Boiling Point:

>> >290 °C

Solubility:

>> Soluble in xylene and acetone

>> Solubility in water: none

Density:

>> 1.06 at 20 °C

>> Relative density (water = 1): 1.06

Vapor Pressure:

>> 0.00000014 [mmHg]

>> Vapor pressure, Pa at 20 °C:

Stability/Shelf Life:

>> Stable under irradiation, in most organic solvents, and on inorganic mineral diluents.

Decomposition:

>> When heated to decomposition it emits acrid smoke and fumes. /(+)-cis,trans-Phenothrin/

pH:

pH is an expression of hydrogen ion concentration in water. Specifically, pH is the negative logarithm of hydrogen ion (H+) concentration (mol/L) in an aqueous solution. The term is used to indicate basicity or acidity of a solution on a scale of 0 to 14, with pH 7 being neutral.

>> pH = 5.16 at 20 °C

Refractive Index:

>> Index of refraction: 1.5483 at 25 °C/D

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.

>> 187.5 Å² [M+H]+ [CCS Type: TW; Method: calibrated with polyalanine and drug standards]

10. Stability And Reactivity

>> Insoluble in water. Hydrolyzed by alkalis.

11. Toxicological Information

Toxicity Summary:

>> Both type I and type II pyrethroids exert their effect by prolonging the open phase of the sodium channel gates when a nerve cell is excited. They appear to bind to the membrane lipid phase in the immediate vicinity of the sodium channel, thus modifying the channel kinetics. This blocks the closing of the sodium gates in the nerves, and thus prolongs the return of the membrane potential to its resting state. The repetitive (sensory, motor) neuronal discharge and a prolonged negative afterpotential produces effects quite similar to those produced by DDT, leading to hyperactivity of the nervous system which can result in paralysis and/or death. Other mechanisms of action of pyrethroids include antagonism of gamma-aminobutyric acid (GABA)-mediated inhibition, modulation of nicotinic cholinergic transmission, enhancement of noradrenaline release, and actions on calcium ions. They also inhibit calium channels and Ca2+, Mg2+-ATPase. (T10, T18, L857)

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

>> d-Phenothrin (Sumithrin)

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

>> 0.3

Acute or One Day HHBPs [ppb]

>> 8000

Acute HHBP Sensitive Lifestage/Population

>> Females 13-49 yrs

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

>> 0.07

Chronic or One Day HHBPs [ppb]

>> 400

Chronic HHBP Sensitive Lifestage/Population

>> General Population

Reference (PDF)

>> Human Health Benchmarks for Pesticides - 2021 Update

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:

>> Pyrethroid effects typically include rapid onset of aggressive behavior and increased sensitivity to external stimuli, followed by fine tremor, prostration with coarse whole body tremor, elevated body temperature, coma, and death. Paresthesia, severe corneal damage, hypotension and tachycardia, associated with anaphylaxis, can also occur following pyrethriod poisoning. (L857)

Exposure Routes:

>> The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

>> Inhalation (L857); oral (L857); dermal (L857) ; eye contact (L857).

Eye Exposure

>> Redness.

>> Following oral exposure, severe fine tremor, marked reflex hyperexcitability, sympathetic activation can occur. Nausea, vomiting and abdominal pain commonly occur and develop following ingestion. Sudden bronchospasm, swelling of oral and laryngeal mucous membranes, and anaphylactoid reactions have been reported after inhalation. Hypersensitivity reactions characterized by pneumonitis, cough, dyspnea, wheezing, chest pain, and bronchospasm may occur too . Dermatitis is the main effect of a dermal exposure to phenothrin. (T36)

Adverse Effects:

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

>> Neurotoxin - Other CNS neurotoxin

>> Occupational hepatotoxin - Secondary hepatotoxins: the potential for toxic effect in the occupational setting is based on cases of poisoning by human ingestion or animal experimentation.

Toxicity Data:

>> LD50: > 5000 mg/kg (Oral, Rat) (A561) LD50: 10 000 mg/kg (Dermal, Rat) (A561)

Treatment:

Treatment when exposed to toxin

>> Following oral exposure, the treatment is symptomatic and supportive and includes monitoring for the development of hypersensitivity reactions with respiratory distress. Provide adequate airway management when needed. Gastric decontamination is usually not required unless the pyrethrin product is combined with a hydrocarbon. Following inhalation exposure, move patient to fresh air. monitor for respiratory distress. If cough or difficulty breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Administer oxygen and assist ventilation as required. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. In case of eye exposure, irrigate exposed eyes with copious amounts of room temperature water for at least 15 minutes. If irritation, pain, swelling, lacrimation, or photophobia persist, the patient should be seen in a health care facility. If the contamination occurs through dermal exposure, Remove contaminated clothing and wash exposed area thoroughly with soap and water. A physician may need to examine the area if irritation or pain persists. Vitamin E topical application is highly effective in relieving parenthesis. (L363)

Interactions:

>> /Pyrethroid/ detoxification ... important in flies, may be delayed by the addition of synergists ... organophosphates or carbamates ... to guarantee a lethal effect. ... /Pyrethroid/

Antidote and Emergency Treatment:

>> Emergency and supportive measures: Treat bronchospasm and anaphylaxis if they occur. Observe patients with a history of large ingestions for at least 4-6 hours for any signs of CNS depression or seizures. /Pyrethrins and pyrethroids/

Human Toxicity Excerpts:

>> /HUMAN EXPOSURE STUDIES/ d-Phenothrin (talc powder formulation with Span 80 as a stabilizer) was applied to the head hair and pudendal hair of eight male human volunteers (three times at intervals of 3 days) at a dose of 32 mg/man per administration (0.44 to 0.67 mg/kg body weight per day). d-Phenothrin powder was washed off 1 hr after application. There were no significant abnormalities due to d-phenothrin in terms of dermal irritation, clinical signs, or blood biochemical and hematological parameters. The blood levels of d-phenothrin were below the detection limit ...

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Sprague Dawley rats exposed to d-phenothrin by inhalation at concentrations of up to 3760 mg/cu m for 4 hr showed no toxic signs as a result of exposure. Histopathologically, there were no compound-related alterations in the sciatic nerve.

Non-Human Toxicity Values:

>> LD50 Rat oral greater than 500 mg/kg

Populations at Special Risk:

>> Chronic respiratory disease: In persons with chronic respiratory disease, especially asthma, the inhalation of /pyrethroids/ might cause exacerbation of symptoms due to its sensitizing properities. Skin disease: /Pyrethroids/ can cause dermatitis which may be allergic in nature. Persons with pre-existing skin disorders may be more susceptible to the effects of this agent. ... /Pyrethroids/

12. Ecological Information

ICSC Environmental Data:

>> The substance is very 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.

13. Disposal Considerations

Spillage Disposal

>> Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Disposal Methods

>> SRP: The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational exposure or environmental contamination. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in soil or water; effects on animal, aquatic, and plant life; and conformance with environmental and public health regulations.

>> This pesticide is highly toxic to fish and aquatic invertebrates. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Eliminations System (NPDES) permit and the permitting authority has notified in writing prior to discharge.

>> Incineration would be an effective disposal procedure where permitted. ... /Pyrethrin products/

>> Disposal: Waste that contains d-phenothrin should be burnt in an appropriate high-temperature incinerator with effluent scrubbing. If no incinerator is available, contaminated absorbents or surplus products should be decomposed by hydrolysis at pH 12 or above. Contact with a suitable hydrolyzing agent is required to ensure degradation of the active ingredient to a safe level. For emulsifiable material, use 5% sodium hydroxide (caustic soda) solution or saturated (7-10%) sodium carbonate (washing soda) solution. For non-emulsifiable material, use a 1:1 mixture (by volume) of caustic soda or washing soda (as above) and a water/oil soluble solvent such as denatured alcohol, monoethylene glycol, hexylene glycol, or isopropylalcohol. Cover the material with a hydrolyzing agent and let it stand for 7 days. Before disposal, the waste must be analyzed to ensure that the active ingredient has been degraded to a safe level. Never pour untreated waste or surplus products into public sewers or where there is any danger of run-off or seepage to streams, water-courses, open waterways, ditches, fields with drainage systems, or to the catchment areas of boreholes, wells, springs, or ponds.

14. Transport Information

DOT

Phenothrin

IATA

Phenothrin

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15. Regulatory Information

Regulatory Information

New Zealand EPA Inventory of Chemical Status

>> Phenothrin: HSNO Approval: HSR003317 Approved with controls

16. Other Information

Other Safety Information

Chemical Assessment

>> IMAP assessments - Cyclopropane carboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, (3-phenoxyphenyl)methyl ester: Human health tier I assessment

>> IMAP assessments - Cyclopropane carboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, (3-phenoxyphenyl)methyl ester: Environment tier I assessment

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