SAFETY DATA SHEET

Updated on 20/07/2024

1. Material Identification

Product Name : Cyhalothrin
Catalog Number : io-2076
CAS Number : 68085-85-8
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 (98.53%): Toxic if swallowed [Danger Acute toxicity, oral]

>> H312 (42.65%): Harmful in contact with skin [Warning Acute toxicity, dermal]

>> H315 (55.88%): Causes skin irritation [Warning Skin corrosion/irritation]

>> H317 (97.06%): May cause an allergic skin reaction [Warning Sensitization, Skin]

>> H319 (57.35%): Causes serious eye irritation [Warning Serious eye damage/eye irritation]

>> H330 (98.53%): Fatal if inhaled [Danger Acute toxicity, inhalation]

>> H400 (98.53%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (98.53%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P260, P261, P264, P264+P265, P270, P271, P272, P273, P280, P284, P301+P316, P302+P352, P304+P340, P305+P351+P338, P316, P317, P320, P321, P330, P332+P317, P333+P317, P337+P317, P362+P364, P391, P403+P233, P405, and P501

Health Hazards:

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

>> Highly toxic, may be fatal if inhaled, ingested or absorbed through skin. Avoid any skin contact. Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination. (ERG, 2024)

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

>> Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Containers may explode when heated. Runoff may pollute waterways. (ERG, 2024)

>> 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 : Cyhalothrin
CAS Number : 68085-85-8
Molecular Formula : C23H19ClF3NO3
Molecular Weight : 449.8000 g/mol

4. First Aid Measures

First Aid:

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

>> 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. Do NOT induce vomiting. Refer for medical attention .

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

>> Do NOT induce vomiting. Refer for medical attention .

5. Fire Fighting Measures

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

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

>> LARGE FIRE: Water spray, fog or regular foam. If it can be done safely, move undamaged containers away from the area around the fire. Dike runoff from fire control for later disposal. Avoid aiming straight or solid streams directly onto the product.

>> FIRE INVOLVING TANKS, RAIL TANK CARS OR HIGHWAY TANKS: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Do not get water inside containers. 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. For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn. (ERG, 2024)

>> Use alcohol-resistant foam, dry sand, powder, carbon dioxide. NO water.

>> Use alcohol-resistant foam, dry sand, 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.

>> Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in lime, damp sawdust, sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT wash away into sewer.

7. Handling And Storage

Safe Storage:

>> Provision to contain effluent from fire extinguishing. Separated from strong oxidants and food and feedstuffs. Well closed. Keep in a well-ventilated room.

Storage Conditions:

>> Keep away from food, feedstuffs, and water supplies. Store in original container with the lid tightly closed. Avoid extremes of cold and hot temperatures. Prolonged storage can cause a slight settling, lightly shake container before use. /Declare Insecticide, 14.4 % gamma-Cyhalothrin/

8. Exposure Control/ Personal Protection

Inhalation Risk:

>> Evaporation at 20 °C is negligible; a harmful concentration of airborne particles can, however, be reached quickly on spraying.

Effects of Short Term Exposure:

>> The substance is irritating to the eyes, skin and respiratory tract. The substance may cause effects on the nerve terminals of the skin. This may result in subjective facial skin sensation characterized by tingling, burning or numb sensation.

Effects of Long Term Exposure:

>> Repeated or prolonged contact may cause skin sensitization.

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.

>> OPP RfD= 0.005 mg/kg; EPA RfD= 0.005 mg/kg; WHO RfD= 0.02 mg/kg

Fire Prevention

>> NO open flames.

Exposure Prevention

>> PREVENT GENERATION OF MISTS! STRICT HYGIENE! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!

Inhalation Prevention

>> Use ventilation, local exhaust or breathing protection.

Skin Prevention

>> Protective gloves. Protective clothing.

Eye Prevention

>> Wear safety goggles or face shield.

Ingestion Prevention

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

9. Physical And Chemical Properties

Molecular Weight:

>> 449.8

Exact Mass:

>> 449.1005556

Physical Description:

>> Cyhalothrin is a colorless solid. Insoluble in water. Used as a wide spectrum insecticide.

>> YELLOW-BROWN VISCOUS (TECHNICAL-GRADE PRODUCT) LIQUID WITH CHARACTERISTIC ODOUR.

Color/Form:

>> Viscous liquid yellow-brown

Odor:

>> Mild

Boiling Point:

>> Does not boil at atmospheric pressure

Melting Point:

>> Below 10 °C

>> 49.2 °C

Solubility:

>> In acetone, dichloromethane, methanol, diethyl ether, ethyl acetate, hexane, toluene, all >500 g/L (20 °C)

>> Solubility in water: none

Density:

>> 1.25 at 25 °C

>> Relative density (water = 1): 1.2

Vapor Pressure:

>> 0.00000001 [mmHg]

>> Vapor pressure, Pa at 20 °C:

LogP:

>> log Kow = 6.8

>> 6.9

Stability/Shelf Life:

>> Stable to decomp & cis-trans isomerization for at least 4 yr in the dark at 50 °C. Stable to light; loss on storage in the light is < 10% in 20 months. Decomposes at 275 °C. Slowly hydrolyzed by water in sunlight at pH 7-9, more rapidly at pH >9.

Decomposition:

>> HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, hydrogen chloride, hydrogen fluoride, nitrogen oxides, hydrogen cyanide, and various chlorinated and fluorinated organic compounds. /Declare Insecticide, 14.4 % gamma-Cyhalothrin/

>> 275 °C

Refractive Index:

>> Index of refraction: 1.534 at 24 °C/D

10. Stability And Reactivity

>> Insoluble in water.

11. Toxicological Information

Toxicity Summary:

>> Metabolic studies have been carried out on /various mammalian species/. In rats and dogs, cyhalothrin has been shown to be well absorbed after oral administration, extensively metabolized, and eliminated as polar conjugates in urine. ... Residues in rats were eliminated with a half-life of 23 days. ... In all mammalian species investigated, cyhalothrin has been found to be extensively metabolized as a result of ester cleavage to the cyclopropanecarboxylic acid and 3-phenoxybenzoic acid, and eliminated as conjugates. In fish, the main residue in tissues consists of unchanged cyhalothrin, and there are lower levels of the ester cleavage products. Under laboratory conditions of constant toxicant concentrations, cyhalothrin and lambda-cyhalothrin are highly toxic to fish and to aquatic invertebrates. ... Accumulation studies conducted under laboratory conditions with constant concentration show that rapid uptake takes place in fish ... Since the compound is rapidly absorbed and degraded under natural conditions, there will not be any practical problems concerning the accumulation of residues or the toxicity of cyhalothrin or lambda-cyhalothrin in aquatic species. Cyhalothrin and lambda-cyhalothrin are virtually non-toxic to birds ... Under laboratory conditions, cyhalothrin and lambda-cyhalothrin are toxic to honey bees ... However, in the field the hazard is lower ... Cyhalothrin and lambda-cyhalothrin are type II pyrethroids; clinical signs /of toxicity/ include ataxia, unsteady gait, and hyperexcitability. In the rabbit, cyhalothrin is a moderate eye irritant and lambda-cyhalothrin is a mild eye irritant; both are mild skin irritants. /Cyhalothrin/ is a moderate skin sensitizer in the guinea pig. Lambda-cyhalothrin is not a skin sensitizer. ... Cyhalothrin and lambda-cyhalothrin gave negative results in a range of in vivo and in vitro assays designed to detect gene mutations, chromosomal damage, and other genotoxic effects. When orally administered to the rat and rabbit during the period of major organogenesis, cyhalothrin was neither embryotoxic or teratogenic at dose levels that elicited maternal toxicity ... In manufacturing, formulation, laboratory work and field usage, /human/ symptoms of subjective facial sensation have been reported. ... Subjective facial skin sensations, which may be experienced by people who handle cyhalothrin and lambda-cyhalothrin are believed to be brought about by repetitive firing of sensory nerve terminals in the skin. They may be considered as an early warning signal indicating that overexposure of the skin has occurred. ... The exposure of the general population to cyhalothrin and lambda-cyhalothrin is expected to be very low and is not likely to present a hazard under recommended conditions of use. ... Cyhalothrin and lambda-cyhalothrin are unlikely to present a hazard to those occupationally exposed. ... Under laboratory conditions cyhalothrin and lambda-cyhalothrin are highly toxic to fish, aquatic arthropods, and honey bees. However, under field conditions, lasting adverse effects are not likely to occur under recommended conditions of use.

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: Group D Not Classifiable as to Human Carcinogenicity

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:

>> At high doses, signs of poisoning attributable to cyhalothrin include profuse salivation and pulmonary edema, clonic seizures, opisthotonos (i.e., the spine is bent forward such that a supine body rests on its head and heels), coma, and death. At lower doses, commonly observed effects include paresthesia and erythema. (L863)

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).

Inhalation Exposure

>> Burning sensation. Cough. Sore throat.

Skin Exposure

>> Numbness. Tingling sensation. Redness.

Eye Exposure

>> Redness. Pain.

Ingestion Exposure

>> Abdominal pain. Cough.

>> Following dermal exposure to cyhalothrin, feelings of numbness, itching, burning, stinging, tingling, or warmth may occur, that could last for a few hours. Dizziness, headache, nausea, muscle twitching, reduced energy, and changes in awareness can result from inhalation or ingestion of large amounts of cyhalothrin. Paralysis can occur after exposure. (L857)

Target Organs:

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

>> Developmental

Adverse Effects:

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

>> Neurotoxin - Other CNS neurotoxin

>> Skin Sensitizer - An agent that can induce an allergic reaction in the skin.

Toxicity Data:

>> LC50 (rat) = 83 mg/m3/4h

Minimum Risk Level:

The minimal risk level (MRL) is an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health

>> Acute Oral: 0.01 mg/kg/day (Dog) (L857)

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:

>> Skin decontamination. Wash skin promptly with soap and water ... . If irritant or paresthetic effects occur, obtain treatment by a physician. Because volatilization of pyrethroids apparently accounts for paresthesia affecting the face, strenuous measures should be taken (ventilation, protective face mask and hood) to avoid vapor contact with the face and eyes. Vitamin E oil preparations (dL-alpha tocopheryl acetate) are uniquely effective in preventing and stopping the paresthetic reaction. They are safe for application to the skin under field conditions. Corn oil is somewhat effective, but possible side effects with continuing use make it less suitable. Vaseline is less effective than corn oil. Zinc oxide actually worsens the reaction. /Pyrethroids/

Human Toxicity Excerpts:

>> /SIGNS AND SYMPTOMS/ Cyhalothrin is known to produce an effect described as subjective facial sensation in some people working with this compound. Subjective facial sensation is a transient phenomenon; symptoms are not associated with objective physical signs and recovery appears to be complete. It is likely that subjective facial sensation arises from direct facial contact with the chemical particularly from touching the face with contaminated gloves or hands. This would also help to explain the effect of formulation or concentration as these could affect the rate of dermal penetration and therefore access of the chemical to the nerve endings. It appears unlikely that individual sensitivity is important in the development of symptoms following exposure. It is more likely to be related to the amount of the chemical that comes into contact with the facial skin.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ A skin sensitization test with cyhalothrin on guinea pigs, using the procedure of Buehler, indicated that cyhalothrin has skin-sensitizing potential. In guinea pigs that had been previously induced with undiluted cyhalothrin technical material, using the Magnusson and Kligman maximization test, a moderate sensitization response was elicited.

Non-Human Toxicity Values:

>> LD50 Rat (female) oral 144 mg/kg

12. Ecological Information

ICSC Environmental Data:

>> The substance is very toxic to aquatic organisms. This substance may be hazardous to the environment. Special attention should be given to bees. Avoid release to the environment in circumstances different to normal use.

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> SEDIMENT: Sediment from 15 lakes and two rivers in the Sparta National Guard Armory area of IL was tested in 2003; three of the 45 samples contained lambda-cyhalothrin in concentrations of 1.2 to 2.1 ug/kg(1).

Fish/Seafood Concentrations:

Concentrations of this compound in fish or seafood.

>> Fish (common carp, largemouth bass, small mouth buffalo, spotted sucker, yellow bullhead catfish) from 15 lakes and two rivers in the Sparta National Guard Armory area of IL were tested in 2003; lambda-cyhalothrin was reported as not detected (detection limit not specified) in all 85 samples taken(1).

13. Disposal Considerations

Spillage Disposal

>> Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in lime, damp sawdust, sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT wash away into sewer.

>> Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into sealable containers. Carefully collect remainder. Then store and dispose of according to local regulations. Do NOT wash away into sewer.

Disposal Methods

>> SRP: The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational harm/injury/toxicity 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 and plant life; and conformance with environmental and public health regulations.

>> SRP: Wastewater from contaminant suppression, cleaning of protective clothing/equipment, or contaminated sites should be contained and evaluated for subject chemical or decomposition product concentrations. Concentrations shall be lower than applicable environmental discharge or disposal criteria. Alternatively, pretreatment and/or discharge to a permitted wastewater treatment facility is acceptable only after review by the governing authority and assurance that "pass through" violations will not occur. Due consideration shall be given to remediation worker exposure (inhalation, dermal and ingestion) as well as fate during treatment, transfer and disposal. If it is not practicable to manage the chemical in this fashion, it must be evaluated in accordance with EPA 40 CFR Part 261, specifically Subpart B, in order to determine the appropriate local, state and federal requirements for disposal.

>> Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance. /Warrior II with Zeon Technology, 22.8% lambda-Cyhalothrin/

>> Container Handling [less than 5 gallons]: Non-refillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use and disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. /Warrior II with Zeon Technology, 22.8% lambda-Cyhalothrin/

>> Container Handling [Bulk/Mini-Bulk]: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the person refilling. To clean container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. /Warrior II with Zeon Technology, 22.8% lambda-Cyhalothrin/

14. Transport Information

DOT

Cyhalothrin
6.1
UN Pack Group: III

IATA

Cyhalothrin
6.1,
UN Pack Group: III

15. Regulatory Information

Regulatory Information

REACH Registered Substance

>> Status: No longer Valid Update: 15-12-2008 https://echa.europa.eu/registration-dossier/-/registered-dossier/4237

New Zealand EPA Inventory of Chemical Status

>> Cyhalothrin: HSNO Approval: HSR002832 Approved with controls

16. Other Information

Toxic Combustion Products:

Toxic products (e.g., gases and vapors) produced from the combustion of this chemical.

>> Combustion and/or pyrolysis of cyhalothrin can lead potentially to the production of compounds such as formaldehyde, acrolein, hydrogen cyanide, hydrogen chloride and hydrogen fluoride.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Cyclopropanecarboxylic acid, 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-, cyano(3-phenoxyphenyl)methyl ester: Environment tier I assessment

>> IMAP assessments - Cyclopropanecarboxylic acid, 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-, cyano(3-phenoxyphenyl)methyl ester: Human health tier I assessment

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of the product's properties. Ionz is not responsible for any damages resulting from handling or contact with the product incorrectly."