SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Cyfluthrin
Catalog Number : io-2075
CAS Number : 68359-37-5
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

>> H300+H330 (48.5%): Fatal if swallowed or if inhaled [Danger Acute toxicity, oral; acute toxicity, inhalation]

>> H300 (100%): Fatal if swallowed [Danger Acute toxicity, oral]

>> H330 (84.1%): Fatal if inhaled [Danger Acute toxicity, inhalation]

>> H331 (17.8%): Toxic if inhaled [Danger Acute toxicity, inhalation]

>> H362 (43.6%): May cause harm to breast-fed children [Reproductive toxicity, effects on or via lactation]

>> H370 (43.6%): 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

>> P203, P260, P261, P263, P264, P270, P271, P273, P284, P301+P316, P304+P340, P308+P316, P316, P318, P320, P321, P330, 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. See Chemical dangers Gives off irritating or toxic fumes (or gases) in a fire. Finely dispersed particles form explosive mixtures in air. Risk of fire and explosion on contact with strong oxidants.

3. Composition/Information On Ingredients

Chemical name : Cyfluthrin
CAS Number : 68359-37-5
Molecular Formula : C22H18Cl2FNO3
Molecular Weight : 434.3000 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. Refer for medical attention.

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. Give a slurry of activated charcoal in water to drink. Do NOT induce vomiting. Refer immediately 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 powder, water spray, foam, 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: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Ventilation. Do NOT let this chemical enter the environment. If solid: sweep spilled substance into sealable containers. If liquid: collect leaking liquid in sealable containers as far as possible. Absorb remaining liquid in dry sand or inert absorbent. Then store and dispose of according to local regulations.

7. Handling And Storage

Safe Storage:

>> Keep in a well-ventilated room. Well closed. Separated from strong oxidants, strong acids and strong bases. Separated from food and feedstuffs. Store in an area without drain or sewer access. Provision to contain effluent from fire extinguishing.

Storage Conditions:

>> PESTICIDE STORAGE: Store in a cool, dry place and away from open flame and extreme heat. Store in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in locked storage area. Handle and open container in a manner as to prevent spillage. If container is leaking, invert container to prevent leakage. If the container is leaking or material spilled for any reason or cause, carefully dam up spilled material to prevent runoff. Refer to Precautionary Statements on /product/ label for hazards associated with the handling of this material. Do not walk through spilled material. ... /Baythroid XL/

8. Exposure Control/ Personal Protection

MAK (Maximale Arbeitsplatz Konzentration)

>> (inhalable fraction): 0.01 mg/m

Inhalation Risk:

>> A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

Effects of Short Term Exposure:

>> The substance may cause effects on the nervous system.

Effects of Long Term Exposure:

>> See Acute Hazards/Symptoms.

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: 0.02 mg/kg

Fire Prevention

>> NO open flames. NO contact with oxidizing agents. Prevent build-up of electrostatic charges (e.g., by grounding).

Exposure Prevention

>> STRICT HYGIENE!

Inhalation Prevention

>> Avoid inhalation of fine dust. Use local exhaust and breathing protection.

Skin Prevention

>> Protective clothing. Protective gloves.

Eye Prevention

>> Wear face shield or safety goggles.

Ingestion Prevention

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

Exposure Control and Personal Protection

Maximum Allowable Concentration (MAK)

>> 0.01 [mg/m3], inhalable fraction[German Research Foundation (DFG)]

9. Physical And Chemical Properties

Molecular Weight:

>> 434.3

Exact Mass:

>> 433.0647770

Physical Description:

>> Cyfluthrin appears as a viscous amber partly crystalline oil. Used as an insecticide.

>> BROWN CRYSTALS WITH CHARACTERISTIC ODOUR.

Color/Form:

>> Yellowish-brown oil

Odor:

>> Aromatic solvent odor at room temp

Melting Point:

>> 60 °C

>> 60 °C

Solubility:

>> >1000 g/L dichloromethane

>> Solubility in water, mg/l at 20 °C: 0.003

Density:

>> 1.34 g/cu cm at 22 °C

>> Density (at 20 °C): 1.27 g/cm³

Vapor Pressure:

>> 1.50X10-10 mm Hg at 20 °C

>> negligible

LogP:

>> log Kow = 5.95

>> 5.9

Stability/Shelf Life:

>> Pyrethrins ... /are/ stable for long periods in water-based aerosols where ... emulsifiers give neutral water systems. /Pyrethrins/

Refractive Index:

>> Index of refraction: 1.5511 at 23 °C/D

10. Stability And Reactivity

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

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

>> Beta Cyfluthrin

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

>> 0.0117

Acute or One Day HHBPs [ppb]

>> 78

Acute HHBP Sensitive Lifestage/Population

>> Children

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

>> Cyfluthrin

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

>> 78

Benchmark Remarks

>> Acute HHBP for children; acute endpoint is protective of repeated/chronic exposures

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:

>> At high doses, signs of poisoning attributable to cyfluthrin 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. As for other type 2 pyrethroids, cyfluthrin produces a severe syndrome characterized by salivation and choreoathetosis. (L863)

Exposure Routes:

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

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

Inhalation Exposure

>> Headache. Nausea. Vomiting.

Skin Exposure

>> Redness. Tingling sensation.

Eye Exposure

>> Redness. Watering of the eyes.

Ingestion Exposure

>> Burning sensation in the mouth. Excessive salivation. Headache. Nausea. Vomiting.

>> Following dermal exposure to cyfluthrin, 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 cyfluthrin. 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.

>> Urinary

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: 869-1271 mg/kg (Oral, Rat) (L862) LD50: 291-609 mg/kg (Oral, Mouse) (L862) L50: > 5000 mg/kg (Dermal, Rat) (L862)

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:

>> Other treatments. Several drugs are effective in relieving the pyrethroid neurotoxic manifestations observed in deliberately poisoned laboratory animals, but none has been tested in human poisonings. Therefore, neither efficacy nor safety under these circumstances is known. Furthermore, moderate neurotoxic symptoms and signs are likely to resolve spontaneously if they do occur. /Pyrethroids/

Human Toxicity Excerpts:

>> /HUMAN EXPOSURE STUDIES/ Nine male volunteers were exposed to the pyrethroid insecticide cyfluthrin. The study was performed in an exposure room, where an aerosol containing cyfluthrin was sprayed to obtain atmospheres with mean cyfluthrin concentrations of 160 and 40 ug/cu m. Four volunteers were exposed for 10, 30 and 60 min at 160 ug/cu m and another five volunteers were exposed for 60 min at 40 ug/cu m. For 160 ug/cu m exposure urine samples were collected before and immediately after exposure as well as for the periods 1-2, 2-3, 3-4, 4-5, 5-6, 6-12 and 12-24 hr after exposure. For 40 ug/cu m exposure urine samples were collected before and 2 hr after exposure. The main urinary cyfluthrin metabolites, cis-/trans-3-(2,2-dichlorovinyl)-2,2-dimethylycyclopropane carboxylic acid (DCCA) and 4-fluoro-3-phenoxybenzoic acid (FPBA), were determined. The limit of detection (LOD) for all metabolites was 0.0025 ug in an urine sample of 5 mL (0.5 ug/L). After inhalative exposure of 40 ug cyfluthrin/cu m air for 60 min, the amount of metabolites in urine collected in the first 2 hr after exposure was less than the LOD, namely 0.14 ug for cis-DCCA, 0.15-0.28 ug for trans-DCCA and 0.12-0.23 ug for FPBA. Of the metabolites, 93% was excreted within the first 24 hr (peak excretion rates between 0.5 and 3 hr) after inhalative exposure of 160 ug/cu m. The mean half-lives were 6.9 hr for cis-DCCA, 6.2 hr for trans-DCCA and 5.3 hr for FPBA. The mean trans-:cis-DCCA ratio was 1.9 for the time course as well as for each subject. The amount of metabolites in urine depends on the applied dose, on the exposure time and shows interindividual differences.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Cyfluthrin induces signs of toxicity in the species that have been studied that are typical of cyano-containing type-II pyrethroid poisoning. After oral administration, the symptoms of toxicity include increased salivation, uncoordinated movements, increased activity and vocalization, and reduced, labored breathing. These signs appeared within 10-60 min after dosing; the survivors usually recovered within 7-10 days. Apathy, straddle-legged gait (mostly in the rear legs), and reduced sensitivity to external stimuli were observed after the acute intoxication phase. Rabbits showed signs of apathy and suppression of appetite, while dogs vomited for up to 5 hr after treatment with 50-100 mg/kg bw.

Non-Human Toxicity Values:

>> LD50 Rat male oral 500-800 mg/kg, and in female rat 1,200 mg/kg

12. Ecological Information

Resident Soil (mg/kg)

>> 1.60e+03

Industrial Soil (mg/kg)

>> 2.10e+04

Tapwater (ug/L)

>> 1.20e+02

MCL (ug/L)

>> 2.00e+02

Risk-based SSL (mg/kg)

>> 3.10e+01

Chronic Oral Reference Dose (mg/kg-day)

>> 2.50e-02

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

Fraction of Contaminant Absorbed Dermally from Soil

>> 0.1

ICSC Environmental Data:

>> The substance is very toxic to aquatic organisms. The substance may cause long-term effects in the aquatic environment. 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

>> Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Ventilation. Do NOT let this chemical enter the environment. If solid: sweep spilled substance into sealable containers. If liquid: collect leaking liquid in sealable containers as far as possible. Absorb remaining liquid in dry 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.

>> PESTICIDE 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. CONTAINER DISPOSAL - NON-REFILLABLE CONTAINER: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. CONTAINER DISPOSAL - RETURNABLE/REFILLABLE SEALED CONTAINER: Do not rinse container. Do not break seals. Replace the dust cover/cap and return container, intact to point of purchase. /Baythroid XL/

14. Transport Information

DOT

Cyfluthrin
6.1
UN Pack Group: II

IATA

Cyfluthrin
6.1,
UN Pack Group: II

15. Regulatory Information

Regulatory Information

New Zealand EPA Inventory of Chemical Status

>> Cyfluthrin: HSNO Approval: HSR002831 Approved with controls

16. Other Information

Other Safety Information

Chemical Assessment

- IMAP assessments - Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, cyano(4-fluoro-3-phenoxyphenyl)methyl ester: Environment tier I assessment
- IMAP assessments - Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, cyano(4-fluoro-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."