Cypermethrin

sc-24012

Material Safety Data Sheet

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Cypermethrin

STATEMENT OF HAZARDOUS NATURE
CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA

SUPPLIER
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800
EMERGENCY:
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS
C22-H19-Cl2-N-O3, "cyclopropanecarboxylic acid, 3-(2, 2-dichloroethenyl)-2, 2-dimethyl-, ", "cyano(3-phenoxyphenyl) methyl ester", "[cyano(3-phenoxyphenyl)methyl-3-(2, 2-dichlorovinyl-", "2, 2-dimethylcyclopropane carboxylate)", "3-(2, 2-dichloroethenyl)-2, 2-dimethylcyclopropaneca", "rboxylic acid", "cyano(3-phenoxyphenyl) methyl ester", "(RS)-a-cyano-3-phenoxybenzyl (1RS, 3RS; 1RS, 3SR)-3-(2, 2-dichlorovinyl)-", "2, 2-dimethylcyclopropanecarboxylate", or, (RS)-a-cyano-3-phenoxybenzyl, "(1RS)-cis-trans-3-(2, 2-dichlorovinyl)-2, 2-dimethyl", "cyclopropanecarboxylate CAS:", cyano(3-phenoxyphenyl)methyl, rboxylate, Agrothrin, "Ambush C", "Ammo (pesticide)", "Antiborer 3767", Ardap, Basathrin, CCN-52, Chinmix, Cybil, Cymbush, Cyperkill, "Cypermethrin Technical", Cypermethrin-25EC, Cypemtryna, Cypor, "EXP 5598", Ectpor, FMC-30980, FMC-45497, FMC-45806, Fendona, Flectron, Hilcyperin, JF-5705F, Kordon, "NRDC 149", "NRDC 160", "NRDC 166", Nurele, Polytrin, RU-27998, Ripcord, "SF 06646", Sherpa, Supercypermethrin, "Supercypermethrin Forte", Supermethrin, "Vucht 424", "WL 43467", WL-8517, YT-305, zeta-cypermethrin, beta-cypermethrin, alpha-cypermethrin, "synthetic pyrethroid insecticide pesticide", pyrethrum/pyrethroid

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	1		
Toxicity:	4		
Body Contact:	3		
Reactivity:	1		
Chronic:	3		

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4

CANADIAN WHMIS SYMBOLS

EMERGENCY OVERVIEW
RISK
Harmful by inhalation.
Toxic if swallowed.
May cause SENSITISATION by skin contact.
Harmful: danger of serious damage to health by prolonged exposure if swallowed.
Irritating to eyes, respiratory system and skin.
Toxic to bees.
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
■ Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.
■ Limited evidence exists that the substance may cause irreversible but non-lethal mutagenic effects following a single exposure.
■ Exposure to cypermethrin may produce convulsions, loss of consciousness and possible death. Short-term exposure to rats of alpha-cypermethrin at concentrations up to 200 mg/kg diet for 5 weeks or up to 180 mg/kg diet per day for 13 weeks did not cause toxic effects. At higher doses rats exhibited signs of intoxication associated with pathology of the nervous system, decreased growth or increased liver and kidney weights. Alpha-cypermethrin induces neurotoxicity due to histopathological alterations of the tibial and sciatic nerves, axonal degeneration and increased beta-galactosidase activity.
Short-term toxicity studies indicate that alpha-cypermethrin is approximately 2 to 3 times more toxic than cypermethrin in rats and dogs. Following oral administration to rats 90% of the dose was eliminated from the body over a 4-day period, 78% in the first day. residues in tissues were low except in fat tissue. In human volunteers 43% of an oral dose (0.25-0.75 mg) was excreted within 24 hours in the urine as free or conjugated cis-cyclopropane carboxylic acid.
EYE

■ This material can cause eye irritation and damage in some persons.
■ If applied to the eyes, this material causes severe eye damage.

SKIN

■ This material can cause inflammation of the skin oncontact in some persons.
■ The material may accentuate any pre-existing dermatitis condition.
■ Occupational dermal exposure to cypermethrin in operators, during mixing/loading, during spraying and washing of equipment, was found to be up to 2.94 mg, 0.61 mg and 0.73 mg respectively. Mild skin sensations were reported during formulation. Single dermal applications of alpha-cypermethrin to mice and rats at 100 and 500 mg/kg body weight did not cause mortality or signs of intoxication.
■ Alpha-substituted synthetic pyrethroids can cause "pins and needles" of the skin with a stinging or burning sensation sometimes progressing to tingling and numbness. Tears, sensitivity to light and swelling of the eyes can occur on direct contact.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ Inhalation of dusts, generated by the material, during the course of normalhandling, may be harmful.
■ The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.
■ Personal exposure levels during formulation of the technical concentrate of cypermethrin have been measured up to 54.1 mg/m3. A 4-hour inhalation exposure of rats to an atmospheric concentration of 400 mg/m3 did not result in mortality or clinical signs.
■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
■ This material, like natural pyrethrins, may cause central stimulation with nausea, vomiting, stomach upset, diarrhea, hypersensitivity, inco-ordination, tremors, muscle paralysis, convulsion, coma and respiratory failure. Type II compounds cause a "Type II syndrome" characterized by irregular jerky movements, increased saliva production without tears, upper abdominal pain, nausea and vomiting, headache, dizziness, loss of appetite, tiredness, chest tightness, blurred vision, "pins and needles", palpitations, coarse muscle jerks in limbs and altered consciousness.
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CHRONIC HEALTH EFFECTS

■ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.
Skin contact with the material is more likely to cause a sensitization reaction in some persons compared to the general population.
There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
There is some evidence that inhaling this product is more likely to cause a sensitization reaction in some persons compared to the general population.
There is some evidence that human exposure to the material may result in developmental toxicity. This evidence is based on animal studies where effects have been observed in the absence of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not secondary non-specific consequences of the other toxic effects.
Exposure to the material may result in a possible risk of irreversible effects. The material may produce mutagenic effects in man. This concern is raised, generally, on the basis of
appropriate studies with similar materials using mammalian somatic cells in vivo. Such findings are often supported by positive results from in vitro mutagenicity studies.
Long-term testing does not indicate any carcinogenic potential for cypermethrin.
Chronic poisoning by natural pyrethrins may result in convulsion, tetanic paralysis, rapid and uneven heart beat, liver and kidney damage, or death.
The natural pyrethrins may produce hypersensitivity, especially following previous sensitising exposure. In general, repeated exposures over 2 or 3 years are required to elicit a response and involve exposure to pyrethrum rather than its individual components (including pyrethrins). The sesquiterpene lactone (pyrethrosin) and the pyrethrum glycoproteins account for the immediate and delayed hypersensitivity seen in guinea pigs following a single injection of ground chrysanthemum in Freud's adjuvant. Mild erythematic vesicular dermatitis (with papules), pruritus, localized oedema (particularly of the face, lips and eyelids), rhinitis, tachycardia, pallor and sweating are the most common syndromes. An initial skin sensitisation can progress to marked dermal oedema and skin cracking. Pyrethrum dermatitis appears to increase in hot weather or under conditions were heavy perspiration is produced. The active ingredients of pyrethrum (except pyrethrin II) are inactive in patch tests. Those patients allergic to ragweed pollen are particularly sensitive to pyrethrin.
Rats fed on a diet of pyrethrins for 5000 ppm for 2 years showed some signs of tissue damage including liver lesions, bile duct proliferation and focal necrosis of the liver cells. A no-effect level of 1000 ppm found in animal experiments correspond to a daily dose of 3600 mg/man.
Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
cypermethrin	52315-07-8	>60
being a mixture of 8 isomers including		
cypermethrin, alpha-	67375-30-8	>20
cypermethrin, beta-	65731-84-2	
cypermethrin, theta-	71697-59-1	
cypermethrin, zeta-	52315-07-8	

Section 4 - FIRST AID MEASURES

SWALLOWED

· Give a slurry of activated charcoal in water to drink. NEVER GIVE AN UNCONSCIOUS PATIENT WATER TO DRINK. · At least 3 tablespoons in a glass of water should be given.

EYE

■ If this product comes in contact with the eyes: · Immediately hold eyelids apart and flush the eye continuously with running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN

■ If skin contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN

■ For chronic or short term repeated exposures to pyrethrum and synthetic pyrethroids: Mammalian toxicity of pyrethrum and synthetic pyrethroids is low, in part because of poor bioavailability and a large first pass extraction by the liver. The most common adverse reaction results from the potent sensitizing effects of pyrethrins.
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Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Negligible
Upper Explosive Limit (%):	Not available
Specific Gravity (water=1):	1.28 @ 22 C.
Lower Explosive Limit (%):	Not available

EXTINGUISHING MEDIA

· Foam.
· Dry chemical powder.

FIRE FIGHTING

· Alert Emergency Responders and tell them location and nature of hazard.
· Wear full body protective clothing with breathing apparatus.
When any large container (including road and rail tankers) is involved in a fire,
consider evacuation by 800 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

· Combustible solid which burns but propagates flame with difficulty.
· Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
Combustion products include: carbon monoxide (CO), carbon dioxide (CO_2), hydrogen chloride, phosgene, nitrogen oxides (NOx), other pyrolysis products typical of burning organic material.
May emit poisonous fumes.

FIRE INCOMPATIBILITY

■ Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids,chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION
Glasses:
Chemical goggles.
Gloves:
Respirator:
Particulate

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
■ Environmental hazard - contain spillage.
· Remove all ignition sources.
· Clean up all spills immediately.
· Avoid contact with skin and eyes.
· Control personal contact by using protective equipment.
· Use dry clean up procedures and avoid generating dust.
· Place in a suitable, labelled container for waste disposal.
MAJOR SPILLS
■ Environmental hazard - contain spillage.
· Clear area of personnel and move upwind.
· Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
· Avoid all personal contact, including inhalation.
· Wear protective clothing when risk of exposure occurs.
Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
· Do NOT cut, drill, grind or weld such containers.
· In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

RECOMMENDED STORAGE METHODS
· Lined metal can, Lined metal pail/drum
· Plastic pail.
For low viscosity materials
· Drums and jerricans must be of the non-removable head type.
· Where a can is to be used as an inner package, the can must have a screwed enclosure.

STORAGE REQUIREMENTS
· Store in original containers.
· Keep containers securely sealed.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC	Notes
Canada - Alberta Occupational Exposure Limits	cypermethrin (Pyrethrum)		5						
Canada - British Columbia Occupational Exposure Limits	cypermethrin (Pyrethrum)		5						S
US NIOSH Recommended Exposure Limits (RELs)	cypermethrin (Pyrethrum)		5						
US OSHA Permissible Exposure Levels (PELs) - Table Z1	cypermethrin (Pyrethrum)		5						
US ACGIH Threshold Limit Values (TLV)	cypermethrin (Pyrethrum)		5						TLV Basis: liver damage; lower respiratory tract irritation
US - Minnesota Permissible Exposure Limits (PELs)	cypermethrin (Pyrethrum)		5						
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	cypermethrin (Pyrethrum)		5						
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	cypermethrin (Pyrethrum)		5						
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	cypermethrin (Pyrethrum)		5						
US - California Permissible Exposure Limits for Chemical Contaminants	cypermethrin (Pyrethrum)		5						
US - Idaho - Limits for Air Contaminants	cypermethrin (Pyrethrum)		5						
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	cypermethrin (Pyrethrum)		5						
US - Hawaii Air Contaminant Limits	cypermethrin (Pyrethrum)		5		10				
US - Alaska Limits for Air Contaminants	cypermethrin (Pyrethrum)		5						
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	cypermethrin (Pyrethrum)		5		10				

Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	cypermethrin (Pyrethrum)	-	5	-	10	
US - Washington Permissible exposure limits of air contaminants	cypermethrin (Pyrethrum)		5		10	
US - Michigan Exposure Limits for Air Contaminants	cypermethrin (Pyrethrum)		5			
Canada - Prince Edward Island Occupational Exposure Limits	cypermethrin (Pyrethrum)		5			TLV Basis: liver damage; lower respiratory tract irritation
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	cypermethrin (Pyrethrum)		5			
Canada - Nova Scotia Occupational Exposure Limits	cypermethrin (Pyrethrum)		5			TLV Basis: liver damage; lower respiratory tract irritation
US - Oregon Permissible Exposure Limits (Z-1)	cypermethrin (Pyrethrum)		5			
Canada - Northwest Territories Occupational Exposure Limits (English)	cypermethrin (Pyrethrum)		5		10	

ENDOELTABLE

PERSONAL PROTECTION

RESPIRATOR

Particulate

Consult your EHS staff for recommendations

EYE

· Safety glasses with side shields.
· Chemical goggles.

HANDS/FEET

■ Wear chemical protective gloves, eg. PVC.

NOTE: The material may produce skin sensitization in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
· Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

OTHER

· Overalls.
· Eyewash unit.

ENGINEERING CONTROLS

· Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
· Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Solid.
Does not mix with water.
Sinks in water.

State	Divided solid	Molecular Weight	416.3
Melting Range (°F)	176.9	Viscosity	Not Applicable
Boiling Range (°F)	383- 392	Solubility in water (g/L)	Immiscible
Flash Point (°F)	Not available	pH (1% solution)	Not applicable
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	Negligible
Upper Explosive Limit (%)	Not available	Specific Gravity (water=1)	1.28 @ 22 C.
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	Not applicable
Volatile Component (%vol)	Nil @ 38 C.	Evaporation Rate	Not applicable

APPEARANCE

Colourless, odourless crystalline solid; insoluble in water. Soluble in methanol, acetone, cyclohexanone and xylene. A racemic mixture of eight isomers; alpha-cypermethrin is a mixture of two of the four cis isomers present to approximately 25% in cypermethrin ie (1R,cis)S and (1S,cis)R which produce 90% of the insecticidal activity. Stable in acidic conditions but hydrolyses at pH 12-13.

log Kow 4.47-6.3

Material	Value

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

· Presence of incompatible materials.
· Product is considered stable.

STORAGE INCOMPATIBILITY

■ Pyrethrins and permethrins:
· are unstable in the presence of light, heat, moisture and air
· are hydrolysed by oxygen and/ or sunlight
· may react with strong oxidisers to produce fire and explosions
· are incompatible with alkalis.
Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

CYPERMETHRIN

TOXICITY AND IRRITATION

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.
■ For cypermethrin:
Toxicological Effects:
Acute toxicity: Cypermethrin is a moderately toxic material by dermal absorption or ingestion . Symptoms of high dermal exposure include numbness, tingling, itching, burning sensation, loss of bladder control, incoordination, seizures, and possible death . Pyrethroids like cypermethrin may adversely affect the central nervous system . Symptoms of high-dose ingestion include nausea, prolonged vomiting, stomach pains, and diarrhea which progresses to convulsions, unconsciousness, and coma. Cypermethrin is a slight skin or eye irritant, and may cause allergic skin reactions . The oral LD50 for cypermethrin in rats is 250 mg/kg (in corn oil) or 4123 mg/kg (in water) . EPA reports an oral LD50 of 187 to 326 mg/kg in male rats and 150 to 500 mg/kg in female rats . The oral LD50 varies from 367 to 2000 mg/kg in female rats, and from 82 to 779 mg/kg in mice, depending on the ratio of cis/trans- isomers present . This wide variation in toxicity may reflect different mixtures of isomers in the materials tested. The dermal LD50 in rats is 1600 mg/kg and in rabbits is greater than 2000 mg/kg .
Reproductive effects: No adverse effects on reproduction were observed in a three-generation study with rats given doses of 37.5 mg/kg/day, the highest dose tested .
Teratogenic effects: Cypermethrin is not teratogenic No birth defects were observed in the offspring of rats given doses as high as 70 mg/kg/day nor in the offspring of rabbits given doses as high as 30 mg/kg/day
Mutagenic effects: Cypermethrin is not mutagenic, but tests with very high doses on mice caused a temporary increase in the number of bone marrow cells with micronuclei. Other tests for mutagenic effects in human, bacterial, and hamster cell cultures and in live mice have been negative .
Carcinogenic effects: EPA has classified cypermethrin as a possible human carcinogen because available information is inconclusive. It caused benign lung tumors in female mice at the highest dose tested (229 mg/kg/day); however, no tumours occurred in rats given high doses of up to 75 mg/kg/day .
Organ toxicity: Pyrethroids like cypermethrin may cause adverse effects on the central nervous system. Rats fed high doses (37.5 mg/kg) of the cis-isomer of cypermethrin for five weeks exhibited severe motor incoordination, while 20 to 30% of rats fed 85 mg/kg died 4 to 17 days after treatment began. Long-term feeding studies have shown increased liver and kidney weights and adverse changes in liver tissues in test animals.. Pathological changes in the cortex of the thymus, liver, adrenal glands, lungs, and skin were observed in rabbits repeatedly fed high doses of cypermethrin .
Fate in humans and animals: In humans, urinary excretion of cypermethrin metabolites was complete 48 hours after the last of five doses of 1.5 mg/kg/day . Studies in rats have shown that cypermethrin is rapidly metabolized by hydroxylation and cleavage, with over 99% being eliminated within hours. The remaining 1% becomes stored in body fat. This portion is eliminated slowly, with a half-life of 18 days for the cis-isomer and 3.4 days for the trans-isomer.
■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.
■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's edema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type.
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CYPERMETHRIN, ZETA-:
CYPERMETHRIN, BETA-:
■ No significant acute toxicological data identified in literature search.
CYPERMETHRIN:

TOXICITY	IRRITATION
Oral (Rat) LD50: 57 mg/kg	Skin (rabbit): non irritating*
Inhalation (Rat) LC50: 7889 mg/m³/4h	Eye (rabbit): mild*
Dermal (Rat) LD50: >1600 mg/kg *[EPA Report]	
Intraperitoneal (Rat) LD50: 404 mg/kg	
Oral (Mouse) LD50: 245.7 mg/kg	
Intraperitoneal (Mouse) LD50: 25 mg/kg	
Oral (Rabbit) LD50: 1500 mg/kg	
Dermal (Rabbit) LD50: >2400 mg/kg	
Oral (Guinea pig) LD50: 500 mg/kg	
Intraperitoneal (Rat) LD50: 43 mg/kg	
Dermal (Rabbit) LD50: 2460 mg/kg	
Oral (Rat) LD50: 86 mg/kg	

■ Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).
NOTE: Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA.
ADI: 0.05 mg/kg/day
NOEL: 4.7 mg/kg/day
Somnolence, convulsions, tremor, spasticity, muscle weakness, respiratory obstruction, lachrymation, normocytic anaemia, leukopenia, ataxia, microcytosis without anaemia, changes in erythrocyte/ leucocyte (WBC), allergic disease in cellular and humoral immune response, proteinuria, hypoglycaemia, cutaneous sensitisation, delayed hypersensitivity, tumours, effects on newborn, effects on embryo/ foetus, paternal effects, specific developmental abnormalities (urogenital system, blood and lymphatic systems, immune and reticuloendothelial system) recorded.
Tumourigenic/ neoplastic by RTECS criteria (facilitates the action of a know carcinogen)

TOXICITY	IRRITATION
CYPERMETHRIN, ALPHA-:	
Oral (Rat) LD50: 79 mg/kg	Nil Reported
Inhalation (Rat) LC50: 1900 mg/m³/4h	
Dermal (Rat) LD50: 500 mg/kg	
Dermal (Rabbit) LD50: 2000 mg/kg	
ADI: 0.05 mg/kg/day	
NOEL: 5 mg/kg/day	

CARCINOGEN

CYPERMETHRIN	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	OPP-CAN

Section 12 - ECOLOGICAL INFORMATION

Toxic to bees.
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
This material and its container must be disposed of as hazardous waste.
Avoid release to the environment.
Refer to special instructions/ safety data sheets.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
cypermethrin	HIGH		MED	LOW
cypermethrin, alpha-	HIGH		MED	LOW
cypermethrin, zeta-	HIGH		MED	LOW

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.
¦ Puncture containers to prevent re-use and bury at an authorized landfill.
Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:
· Reduction
· Reuse
· Recycling
· Disposal (if all else fails)
This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type.
Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.
DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.
· Recycle wherever possible.
· Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

Section 14 - TRANSPORTATION INFORMATION

DOT:
Symbols: None Hazard class or Division: 6.1
Identification Numbers: UN3349 PG: I
Label Codes: 6.1 Special provisions: IB7, IP1,
T6, TP33
Packaging: Exceptions: None Packaging: Non- bulk: 211
Packaging: Exceptions: None Quantity limitations: 5 kg
Passenger aircraft/rail:
Quantity Limitations: Cargo 50 kg Vessel stowage: Location: A
aircraft only:
Vessel stowage: Other: 40 S.M.P.: Severe
Hazardous materials descriptions and proper shipping names:
Pyrethroid pesticide, solid, toxic

Air Transport IATA:

ICAO/IATA Class: 6.1 ICAO/IATA Subrisk: None
UN/ID Number: 3349 Packing Group: I
Special provisions: A3
Cargo Only
Packing Instructions: 607 Maximum Qty/Pack: 50 kg
Passenger and Cargo Passenger and Cargo
Packing Instructions: 606 Maximum Qty/Pack: 5 kg
Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity
Packing Instructions: - Maximum Qty/Pack: -
Shipping Name: PYRETHROID PESTICIDE, SOLID, TOXIC
*(CONTAINS CYPERMETHRIN)

Maritime Transport IMDG:

IMDG Class: 6.1 IMDG Subrisk: None
UN Number: 3349 Packing Group: I
EMS Number: F-A , S-A Special provisions: 61 274
Limited Quantities: 0 Marine Pollutant: Yes
Shipping Name: PYRETHROID PESTICIDE, SOLID, TOXIC

Section 15 - REGULATORY INFORMATION

cypermethrin (CAS: 52315-07-8,69865-47-0,86752-99-0,86753-92-6,88161-75-5,97955-44-7,137497-61-1,139203-31-9,142443-95-6,146909-55-9,186554-45-0,67375-30-8,65731-84-2,71697-59-1) is found on the following regulatory lists;
"Canada - Saskatchewan Environmental Persistent or Chronic Hazardous Substances","OSPAR Substances removed from the List of Substances of Possible Concern","WHO Guidelines for Drinking-water Quality - Chemicals excluded from guideline value derivation"

Regulations for ingredients

cypermethrin, alpha- (CAS: 67375-30-8) is found on the following regulatory lists;
"OSPAR Substances removed from the List of Substances of Possible Concern"

cypermethrin, beta- (CAS: 65731-84-2) is found on the following regulatory lists;
"Canada - Saskatchewan Environmental Persistent or Chronic Hazardous Substances","US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List","US - Massachusetts Oil & Hazardous Material List","US - Pennsylvania - Hazardous Substance List","US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances","US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides","US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act"

cypermethrin, theta- (CAS: 71697-59-1) is found on the following regulatory lists;
"Canada - Saskatchewan Environmental Persistent or Chronic Hazardous Substances","US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List","US - Massachusetts Oil & Hazardous Material List","US - Pennsylvania - Hazardous Substance List","US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances","US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides","US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act"

cypermethrin, zeta- (CAS: 52315-07-8) is found on the following regulatory lists;
"Canada - Saskatchewan Environmental Persistent or Chronic Hazardous Substances","OSPAR Substances removed from the List of Substances of Possible Concern","WHO Guidelines for Drinking-water Quality - Chemicals excluded from guideline value derivation"

Section 16 - OTHER INFORMATION

ND
Substance CAS Suggested codes cypermethrin 65731- 84- 2 cypermethrin, beta- 65731- 84- 2

Ingredients with multiple CAS Nos
Ingredient Name CAS cypermethrin 52315-07-8, 69865-47-0, 86752-99-0, 86753-92-6, 88161-75-5, 97955-44-7, 137497-61-1, 139203-31-9, 142443-95-6, 146909-55-9, 186554-45-0, 67375-30-8, 65731-84-2, 71697-59-1

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■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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