ionz

SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Ethylenebisdithiocarbamic acid, salts & esters
Catalog Number : io-2361
CAS Number : 111-54-6
Identified uses : Laboratory chemicals, manufacture of chemical compounds
Company : Ionz

>> R&D Use only

2. Hazards Identification

GHS Classification:

Flammable liquid (category 2)
Acute toxicity, oral (Category 3)
Acute toxicity, dermal (Category 3)
Acute toxicity, inhalation (Category 3)
Specific target organ toxicity, single exposure (Category 1)

Pictogram(s)

>> Warning

GHS Hazard Statements

>> H317 (100%): May cause an allergic skin reaction [Warning Sensitization, Skin]

>> H335 (100%): May cause respiratory irritation [Warning Specific target organ toxicity, single exposure; Respiratory tract irritation]

Precautionary Statement Codes

>> P261, P271, P272, P280, P302+P352, P304+P340, P319, P321, P333+P317, P362+P364, P403+P233, P405, 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. Gives off irritating or toxic fumes (or gases) in a fire. Finely dispersed particles form explosive mixtures in air.

3. Composition/Information On Ingredients

Chemical name : Ethylenebisdithiocarbamic acid, salts & esters
CAS Number : 111-54-6
Molecular Formula : C4H8N2S4
Molecular Weight : 212.4000 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. 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. Do NOT induce vomiting. Give one or two glasses of water to drink. Refer for medical attention .

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. Induce vomiting (ONLY IN CONSCIOUS PERSONS!).

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)

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

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

>> Use water spray, powder, 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 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.

>> 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 covered labelled containers. If appropriate, moisten first to prevent dusting. Then store and dispose of according to local regulations.

7. Handling And Storage

Safe Storage:

>> Separated from food and feedstuffs, strong bases, amines, amides, acids and strong oxidizers. Store only in original container. Provision to contain effluent from fire extinguishing. Cool. Dry. Keep in the dark. Keep in a well-ventilated room.

Storage Conditions:

>> Store in well-aired, fresh (less than 30 °C), dry area away from dwellings, animal shelters and stored food.

8. Exposure Control/ Personal Protection

Inhalation Risk:

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

Effects of Short Term Exposure:

>> The substance is irritating to the eyes, skin and respiratory tract.

Effects of Long Term Exposure:

>> Repeated or prolonged contact with skin may cause dermatitis. Repeated or prolonged contact may cause skin sensitization. The substance may have effects on the blood, nervous system, liver and thyroid. May cause an increase in cholinesterase activity. Animal tests show that this substance possibly causes toxic effects upon human reproduction.

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.

>> EPA RfD= 0.05 mg/kg; WHO RfD= 0.05 mg/kg

Fire Prevention

>> NO open flames. Closed system, dust explosion-proof electrical equipment and lighting. Prevent deposition of dust.

Exposure Prevention

>> PREVENT DISPERSION OF DUST!

Inhalation Prevention

>> Use 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:

>> 212.4

Exact Mass:

>> 211.95703296

Physical Description:

>> Ethylenebisdithiocarbamic acid, salts and esters is a solid. Very unstable material, used as a pesticide and fungicide.

>> YELLOW POWDER.

Color/Form:

>> Powder or crystals from chloroform + alcohol

Odor:

>> Practically odorless

Boiling Point:

>> decomposes

Melting Point:

>> 157 °C (decomposes)

Flash Point:

>> 138 °C (280 °F)

>> 90 °C

Solubility:

>> less than 1 mg/mL at 77 °F (NTP, 1992)

>> Solubility in water: none

Density:

>> Approx 1.74 at 20 °C

>> Relative density (water = 1): 1.92

Vapor Pressure:

>> 0.00000008 [mmHg]

>> Vapor pressure at 20 °C: negligible

LogP:

>> log Kow = 1.30

>> 1.33

Stability/Shelf Life:

>> Unstable to light, moisture and heat on prolonged storage ...

Autoignition Temperature:

>> 149 °C

>> 149 °C

Decomposition:

>> Decomposes at 157 °C without melting.

>> 157 °C

Polymerization:

Polymerization is a process of reacting monomer molecules together in a chemical reaction to form polymer chains or three-dimensional networks.

>> The heavy metal salts of ethylene bisdithiocarbamic acid, i.e., maneb and zineb, may polymerize, the extent of polymerization depending on the method of preparation.

Dissociation Constants:

>> pKa = 10.3

10. Stability And Reactivity

>> Thio and dithiocarbamates slowly decompose in aqueous solution to form carbon disulfide and methylamine or other amines. Such decompositions are accelerated by acids.

11. Toxicological Information

Toxicity Summary:

>> IDENTIFICATION AND USE: Mancozeb is a greyish-yellow free-flowing powder. It is used for control of many fungal diseases in a wide range of field crops, fruits, nuts, vegetables, and ornamentals. It is also used as seed treatment/protectant. HUMAN EXPOSURE AND TOXICITY: Exposure could lead to toxic epidermal necrolysis (TEN), which is a life-threatening mucocutaneous disease with high mortality. There has been a case of dyshidrotic eczema and sensitization to mancozeb in a florist. A widespread dermatitis was reported by a woman following storage of mancozeb powder in a garage. An epidemiological study suggests that pregnant women living near banana plantations aerially sprayed with mancozeb may be environmentally exposed to Mn, which is a neurotoxicant at high concentrations. Another study demonstrated an augmented risk of cutaneous melanoma among subjects with exposure to mancozeb, in particular among those with occupational sun exposure. There appeared to be an association between mancozeb exposure and a significant increase in the frequencies of cells with structural chromosome aberrations and the number of sister chromatid exchanges per cell in peripheral blood lymphocytes. Slight immunomodulator effect of mancozeb in conditions of low-level, prolonged occupational exposure was observed. ANIMAL STUDIES: Compounds of this class usually have low acute toxicity. Studies in animals suggest that contact dermatitis and thyroid hyperplasia may occur after exposure. Mancozeb was a potent dermal sensitizer in the guinea pig. Cross-sensitization was observed between mancozeb, zineb and maneb. In rats, thyroid follicular cell hyperplasia was seen at 100 ppm and higher doses. Mancozeb exerts dose-dependent damaging effects on the gonads of rats of both sexes. The dose level was 140-1400 mg mancozeb/kg body weight, given twice a week for 4.5 months. Both reproductive and endocrine structures were affected at all dose levels, leading to decreased fertility. In developmental studies in rats, increase in resorbed litters, external hemorrhage and wavy ribs have been observed; no embryotoxicity in absence of maternal toxicity. Rats treated with mancozeb showed dose-dependent signs of depression, adynamia, decreased tonus, disturbances in coordination, paresis, and paralysis of extremities combined with general weakness, lack of appetite, and prostration. Mutagenicity: Bacterial and in vitro mammalian cell systems, chromosome damage in vivo and in mammalian cell transformation tests were negative. Sister chromatid exchanges in Chinese hamster ovary cells in vitro was positive. Mancozeb induces a number of different types of chromosomal aberrations in the bone marrow cells of male mice at various test doses. Mancozeb was examined for its possible mutagenic activity using Salmonella typhimurium tester strains TA97a, TA98, TA100, and TA102 with negative results. In rats treated with mancozeb in vivo, it induced DNA damage as detected by the comet assay and increased the frequency of micronuclei. Acute treatments with mancozeb inhibit cytochrome P450 mediated metabolism. Mancozeb is metabolized to ethylene thiourea (ETU). ETU is a carcinogen, based on thyroid and other cancers in rodents, ETU is also known to cause decreases of thyroxine (T4) and increases in thyroid-stimulating hormone (TSH) in rodents. ECOTOXICITY STUDIES: In a seasonally breeding wildlife bird, Red Munia (Amandava amandava) plasma T4, T3 and TSH were significantly decreased in response to mancozeb. Mancozeb toxicity effects noted in both birds and mammals could be a result of possible hormonal disruptions. The

avian reproductive studies noted reproductive effects such as reductions in: egg production; early and late embryo viability; hatchability; offspring weight at hatch and 14-days of age; and the number of 14-day old survivors. Reduced growth rates were noted in tadpoles exposed to mancozeb. Chronic testing in freshwater organisms showed immobility, length and time until first brood in Daphnia and reduced survival and lack of growth effects in fathead minnow. These effects noted in freshwater species could be a result of possible hormonal disruptions. Lettuce exposure to mancozeb was shown to have a significant impact on plant metabolism, with mature leaves tending to be more extensively affected than younger leaves.

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

>> Mancozeb

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

>> 0.5

Acute or One Day HHBPs [ppb]

>> 3000

Acute HHBP Sensitive Lifestage/Population

>> Children

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

>> 0.016

Chronic or One Day HHBPs [ppb]

>> 90

Chronic HHBP Sensitive Lifestage/Population

>> Females 13-49 yrs

Cancer Quantification c (Q1) Values (CSF) [mg/kg/day]

>> 0.0601j

Carcinogenic HHBP (E-6 to E-4) [ppb]

>> 0.492-49.2

Reference (PDF)

>> Human Health Benchmarks for Pesticides - 2021 Update

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).

>> No data are available in humans. Inadequate evidence of carcinogenicity in animals. OVERALL EVALUATION: Group 3: The agent is not classifiable as to its carcinogenicity 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).

IARC Carcinogenic Agent

>> Zineb

IARC Carcinogenic Classes

>> Group 3: Not classifiable as to its carcinogenicity to humans

IARC Monographs

>> Volume 12: (1976) Some Carbamates, Thiocarbamates and Carbazides

>> Volume Sup 7: Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1 to 42, 1987; 440 pages; ISBN 92-832-1411-0 (out of print)

Exposure Routes:

>> The substance can be absorbed into the body by inhalation.

Inhalation Exposure

>> Cough. Sore throat. Nausea.

Skin Exposure

>> Redness.

Eye Exposure

>> Redness. Pain.

Ingestion Exposure

>> Abdominal cramps. Vomiting. Diarrhoea.

Target Organs:

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

>> Endocrine

Adverse Effects:

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

>> 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.

>> Reproductive Toxin - A chemical that is toxic to the reproductive system, including defects in the progeny and injury to male or female reproductive function. Reproductive toxicity includes developmental effects. See Guidelines for Reproductive Toxicity Risk Assessment.

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

Toxicity Data:

>> LCLo (rat) = 800 mg/m3/4hr

Interactions:

>> Mancozeb, as a dithiocarbamate fungicide, has been found to exhibit toxicological manifestations in different cells, mainly by generation of free radicals which may alter antioxidant defense systems in cells ... In the present study, the effects of mancozeb (0.2, 2 and 5 ug/mL) or mancozeb+ascorbic acid (100 ug/mL), or ascorbic acid alone or control medium alone on the levels of cell viability, apoptosis, intracellular reactive oxygen species production (ROS), mitochondrial membrane potential (MMP) and ATP levels in rat thymocytes were examined in vitro. Cells treated with mancozeb displayed a concentration-dependent increase of hypodiploid cells and ROS production followed by markedly decreased viability of the cells, MMP and ATP levels. Application of ascorbic acid significantly reduced cytotoxicity in cell cultures treated with 0.2 and 2 ug/mL of mancozeb, together with significantly decreased ROS levels and increased MMP and ATP levels. In cells treated with 5 ug/mL of mancozeb, ascorbic acid failed to reduce toxicity while simultaneously increasing the apoptosis rate of thymocytes. These results suggest that ROS plays a significant role in mancozeb-induced toxicity, through alteration of mitochondrial function. Ascorbic acid administration reduced the toxicity rate in cells treated with lower mancozeb concentrations, while it may have the ability to shift cells from necrosis to apoptosis in the presence of highest mancozeb concentrations.

Antidote and Emergency Treatment:

>> Immediate first aid: Remove patient from contact with the material. Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Dithiocarbamates and Related Compounds/

Human Toxicity Excerpts:

>> /HUMAN EXPOSURE STUDIES/ The irritant and allergic potential of most dithiocarbamates is evident in occupational exposure. Skin irritation and sensitization were studied in man using a conventional patch test. A cotton square was dipped in 19% nabam solution and placed on the inner surface of the forearm, and, 14 days later, this procedure was repeated on the opposite forearm. Zineb was tested in the same manner, except that the cotton square was dipped in 65% wettable powder. The patches were left in place for 48 hr. Of the 25 subjects included in the nabam study, 2 showed irritation (mild erythema and itching). Thirteen of the 25 reacted to the retest (from mild erythema to severe erythema, edema, and vesiculation), indicating sensitization. Of the 50 subjects used in the zineb study, no reaction at all was seen in 49 of them. One reacted in such a way that it indicated primary irritation rather than sensitization ...

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Male Wistar rats were given tetraethylthiuramdisulfide, maneb, and zineb as a suspension in saline ip 200 mg/kg daily for 4 days. Rats received a similar dose of ethylenethiourea as a solution in saline ip, and the control rats received a corresponding volume of saline ip. After decapitation, pieces of ileum were taken, and the enzyme histochemical reactivity for the acetylcholinesterase and for the nonspecific cholinesterase in the ilea of the treated and control animals was studied. The reaction intensities in the samples were estimated by eye using a scale from 0 (no reaction product) to 3+ (maximal reaction). Tetraethylthiuramdisulfide was used as an internal standard. Controls showed the maximal reaction for the acetylcholinesterase and for the non-specific cholinesterase. Maneb, ethylene thiourea and zineb showed consistent decrease in the reactivity for the acetylcholinesterase (+ +) and for the non-specific cholinesterase (+ +). The decrease by tetraethylthiuramdisulfide of reactions for both the acetylcholinesterase (+) as well for the non-specific cholinesterase (+) was even more pronounced indicating a possible nerve damage to the cholinergic innervation of rat intestine.

Human Toxicity Values:

Quantitative human toxicity values (e.g., lethal dose) for this compound.

>> Estimated lethal dose for humans 5-15 g/kg.

Non-Human Toxicity Values:

>> LD50 Rat oral >5200 mg/kg

12. Ecological Information

Resident Soil (mg/kg)

>> 1.90e+03

Industrial Soil (mg/kg)

>> 2.50e+04

Tapwater (ug/L)

>> 5.40e+02

MCL (ug/L)

>> 1.50e+01

Risk-based SSL (mg/kg)

>> 7.60e-01

Chronic Oral Reference Dose (mg/kg-day)

>> 3.00e-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.

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> SOIL: The residues of zineb in a soil planted with forage crops decreased from 11.0 ppm to 0.03 ppm within 4 months after surface spraying with 20 kg zineb/ha(1).

Fish/Seafood Concentrations:

Concentrations of this compound in fish or seafood.

>> The level of mancozeb in shellfish from Canadian estuaries was <1.6 ppm, species and date not indicated(1).

Average Daily Intake:

The average amount of the compound taken into the body through eating, drinking, or breathing.

>> Danish farmers (251) were found to have average daily intake of zineb of 0.01 mg/kg day(1).

13. Disposal Considerations

Spillage Disposal

>> 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 covered labelled containers. If appropriate, moisten first to prevent dusting. Then store and dispose of according to local regulations.

>> Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. 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

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number U114, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

>> A potential candidate for liquid injection incineration at a temperature range of 650 to 1,600 °C and a residence time of 0.1 to 2 seconds. A potential candidate for rotary kiln incineration at a temperature range of 820 to 1,600 °C and residence times of seconds for liquids and gases, and hours for solids. A potential candidate for fluidized bed incineration at a temperature range of 450 to 980 °C and residence times of seconds for liquids and gases, and longer for solids. /Ethylenebisdithiocarbamate/

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>> 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.

>> Product: Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Contaminated packaging: Dispose of as unused product.

>> 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 been notified in writing prior to discharge. ... For guidance, contact your State Water Board or Regional Office of the Environmental Protection Agency.

14. Transport Information

DOT

Ethylenebisdithiocarbamic acid, salts & esters
6.1
UN Pack Group: III
Reportable Quantity of 5000 lb or 2270 kg

IATA

Ethylenebisdithiocarbamic acid, salts & esters
6.1,
UN Pack Group: III

15. Regulatory Information

Clean Water Act Requirements:

The Clean Water Act (CWA) of 1972 establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under CWA, the U.S. Environmental Protection Agency (EPA) developed the Toxic Pollutant List (40 CFR Part 401.15) and the Priority Pollutant List (40 CFR Part 423, Appendix A). These lists are to be used by EPA and States to develop the Effluent Guidelines regulations and ensure water quality criteria and standards.

>> Toxic pollutant designated pursuant to section 307(a)(1) of the Federal Water Pollution Control Act and is subject to effluent limitations. /Zinc and compounds/

Regulatory Information

REACH Registered Substance

>> Status: Active Update: 22-06-2022 https://echa.europa.eu/registration-dossier/-/registered-dossier/32347

New Zealand EPA Inventory of Chemical Status

>> Mancozeb (stabilised): HSNO Approval: HSR002904 Approved with controls

New Zealand EPA Inventory of Chemical Status

>> Zineb: HSNO Approval: HSR003171 Approved with controls

16. Other Information

Toxic Combustion Products:

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

>> Gives off irritating or toxic fumes (or gases) in a fire.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Manganese, [[1,2-ethanediylbis[carbamodithioato]](2-)]-, mixture with [[1,2-ethanediylbis(carbamodithioato)](2-)]zinc: Environment tier I assessment

>> IMAP assessments - Manganese, [[1,2-ethanediylbis[carbamodithioato]](2-)]-, mixture with [[1,2-ethanediylbis(carbamodithioato)](2-)]zinc: Human health tier I assessment

Chemical Assessment

>> IMAP assessments - Zinc, [[1,2-ethanediylbis(carbamodithioato)](2-)]-: Environment tier I assessment

>> IMAP assessments - Zinc, [[1,2-ethanediylbis(carbamodithioato)](2-)]-: 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."