SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Maneb
Catalog Number : io-2584
CAS Number : 12427-38-2
Identified uses : Laboratory chemicals, manufacture of chemical compounds
Company : Ionz

>> R&D Use only

2. Hazards Identification

GHS Classification:

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

Pictogram(s)

>> Warning

GHS Hazard Statements

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

>> H361 (90.9%): Suspected of damaging fertility or the unborn child [Warning Reproductive toxicity]

>> H400 (99%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (16%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P203, P261, P272, P273, P280, P302+P352, P318, P321, P333+P317, P362+P364, P391, P405, and P501

Health Hazards:

>> Excerpt from ERG Guide 135 [Substances - Spontaneously Combustible]:

>> Fire will produce irritating, corrosive and/or toxic gases. Inhalation of decomposition products may cause severe injury or death. Contact with substance may cause severe burns to skin and eyes. Runoff from fire control or dilution water may cause environmental contamination. CAUTION: Pentaborane (UN1380) is highly toxic and may be fatal if inhaled, ingested or absorbed through skin. (ERG, 2024)

ERG 2024, Guide 135 (Maneb, stabilized; Maneb)

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>> CAUTION: Pentaborane (UN1380) is highly toxic and may be fatal if inhaled, ingested or absorbed through skin.

>> Excerpt from ERG Guide 135 [Substances - Spontaneously Combustible]:

>> Flammable/combustible material. May ignite on contact with moist air or moisture. May burn rapidly with flare-burning effect. Some react vigorously or explosively on contact with water. Some may decompose explosively when heated or involved in a fire. May re-ignite after fire is extinguished. Runoff may create fire or explosion hazard. Containers may explode when heated. (ERG, 2024)

ERG 2024, Guide 135 (Maneb, stabilized; Maneb)

>> Flammable/combustible material.

>> May ignite on contact with moist air or moisture.

>> May burn rapidly with flare-burning effect.

>> Some react vigorously or explosively on contact with water.

>> Some may decompose explosively when heated or involved in a fire.

>> May re-ignite after fire is extinguished.

>> Runoff may create fire or explosion hazard.

>> Containers may explode when heated.

>> 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 : Maneb
CAS Number : 12427-38-2
Molecular Formula : C4H6MnN2S4
Molecular Weight : 265.3000 g/mol

4. First Aid Measures

First Aid:

>> Excerpt from ERG Guide 135 [Substances - Spontaneously Combustible]:

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

ERG 2024, Guide 135 (Maneb, stabilized; Maneb)

>> General First Aid:

>> Call 911 or emergency medical service.

>> Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and avoid contamination.

>> Move victim to fresh air if it can be done safely.

>> Administer oxygen if breathing is difficult.

>> If victim is not breathing:

>> DO NOT perform mouth-to-mouth resuscitation; the victim may have ingestedor inhaled the substance.

>> If equipped and pulse detected, wash face and mouth, then give artificial respiration using a proper respiratory medical device (bag-valve mask, pocket mask equipped with a one-way valve or other device).

>> If no pulse detected or no respiratory medical device available, provide continuouscompressions. Conduct a pulse check every two minutes or monitor for any signs of spontaneous respirations.

>> Remove and isolate contaminated clothing and shoes.

>> For minor skin contact, avoid spreading material on unaffected skin.

>> In case of contact with substance, remove immediately by flushing skin or eyes with running water for at least 20 minutes.

>> For severe burns, immediate medical attention is required.

>> Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

>> Keep victim calm and warm.

>> Keep victim under observation.

>> For further assistance, contact your local Poison Control Center.

>> Note: Basic Life Support (BLS) and Advanced Life Support (ALS) should be done by trained professionals.

>> In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the "ERAP" section.

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. 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 135 [Substances - Spontaneously Combustible]:

>> DO NOT USE WATER, CO2 OR FOAM ON MATERIAL ITSELF. Some of these materials may react violently with water. CAUTION: For Xanthates, UN3342 and for Dithionite (Hydrosulfite/Hydrosulphite) UN1384, UN1923 and UN1929, USE FLOODING AMOUNTS OF WATER for SMALL AND LARGE fires to stop the reaction. Smothering will not work for these materials, they do not need air to burn.

>> SMALL FIRE: Dry chemical, soda ash, lime or DRY sand, EXCEPT for UN1384, UN1923, UN1929 and UN3342.

>> LARGE FIRE: DRY sand, dry chemical, soda ash or lime EXCEPT for UN1384, UN1923, UN1929 and UN3342, or withdraw from area and let fire burn. CAUTION: UN3342 when flooded with water will continue to evolve flammable Carbon disulfide/Carbon disulphide vapors. If it can be done safely, move undamaged containers away from the area around the fire.

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

>> Use carbon dioxide, dry powder. NO hydrous agents. NO 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 135 [Substances - Spontaneously 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)

Evacuation: ERG 2024, Guide 135 (Maneb, stabilized; Maneb)

>> 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

>> For non-highlighted materials: 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.

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. Do NOT wash away into sewer. Sweep spilled substance into covered sealable containers. Carefully collect remainder. Then store and dispose of according to local regulations.

Accidental Release Measures

Public Safety: ERG 2024, Guide 135 (Maneb, stabilized; Maneb)

>> CALL 911. Then call emergency response telephone number on shipping paper. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.

>> Stay upwind, uphill and/or upstream.

>> Keep unauthorized personnel away.

Spill or Leak: ERG 2024, Guide 135 (Maneb, stabilized; Maneb)

>> ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.

>> Do not touch or walk through spilled material.

>> Stop leak if you can do it without risk.

>> Small Spill

>> CAUTION: For spills of Xanthates, UN3342 and for Dithionite (Hydrosulfite/Hydrosulphite), UN1384, UN1923 and UN1929, dissolve in 5 parts water and collect for proper disposal.

>> CAUTION: UN3342 when flooded with water will continue to evolve flammable Carbon disulfide/Carbon disulphide vapors.

>> Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.

>> Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.

>> Prevent entry into waterways, sewers, basements or confined areas.

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7. Handling And Storage

Safe Storage:

>> Separated from acids and food and feedstuffs. Dry. Well closed. Keep in a well-ventilated room. Store only if stabilized.

Storage Conditions:

>> This product must be stored in its sealed original containers, in well-aired places. It is recommended that the product's temperature should not exceed 25-30 °C. The containers must be stacked in such a way as to permit a free circulation of air also at the bottom & inside of the piles.

8. Exposure Control/ Personal Protection

Emergency Response: ERG 2024, Guide 135 (Maneb, stabilized; Maneb)

>> DO NOT USE WATER, CO2 OR FOAM ON MATERIAL ITSELF.

>> Some of these materials may react violently with water.

>> CAUTION: For Xanthates, UN3342 and for Dithionite (Hydrosulfite/Hydrosulphite) UN1384, UN1923 and UN1929, USE FLOODING AMOUNTS OF WATER for SMALL AND LARGE fires to stop the reaction. Smothering will not work for these materials, they do not need air to burn.

>> Small Fire

>> Dry chemical, soda ash, lime or DRY sand, EXCEPT for UN1384, UN1923, UN1929 and UN3342.

>> Large Fire

>> DRY sand, dry chemical, soda ash or lime EXCEPT for UN1384, UN1923, UN1929 and UN3342, or withdraw from area and let fire burn.

>> CAUTION: UN3342 when flooded with water will continue to evolve flammable Carbon disulfide/Carbon disulphide vapors.

>> If it can be done safely, move undamaged containers away from the area around the fire.

>> 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 or in contact with substance.

>> 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.

Inhalation Risk:

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

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 may cause skin sensitization. The substance may have effects on the kidneys and central nervous system. This may result in kidney impairment and neurologic and neuropsychiatric disorders (manganism).

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= 0.05 mg/kg

Fire Prevention

>> NO open flames. NO contact with water.

Exposure Prevention

>> PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!

Inhalation Prevention

>> Use local exhaust or breathing protection.

Skin Prevention

>> Protective gloves. Protective clothing.

Eye Prevention

>> Wear safety goggles or eye protection in combination with breathing protection.

Ingestion Prevention

>> Do not eat, drink, or smoke during work.

Exposure Control and Personal Protection

Protective Clothing: ERG 2024, Guide 135 (Maneb, stabilized; Maneb)

>> Wear positive pressure self-contained breathing apparatus (SCBA).

>> Wear chemical protective clothing that is specifically recommended by the manufacturer when there is NO RISK OF FIRE.

>> Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

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9. Physical And Chemical Properties

Molecular Weight:

>> 265.3

Exact Mass:

>> 264.879426

Physical Description:

>> Maneb is a yellow powder or crystalline solid. It is denser than water. Contact may irritate skin, eyes and mucous membranes. It may be toxic by ingestion. Likely to generate heat spontaneously upon exposure to air or water. May be sufficient to ignite the material. Maneb is used as a fungicide. Formulations of Maneb include mixing it with many other chemicals such as sulfur, zinc oxide and others to desensitize it. This is done to make it easer for application.

>> YELLOW POWDER OR CRYSTALS.

Color/Form:

>> Yellow powder; crystals from alcohol

Odor:

>> Practically odorless

Melting Point:

>> 200 °C (decomposes)

Flash Point:

>> 138 °C (280 °F)

>> 138 °C o.c.

Solubility:

>> For more Solubility (Complete) data for Maneb (6 total), please visit the HSDB record page.

>> Solubility in water: very poor

Density:

>> 1.92 at 25 °C/4 °C

>> 1.92 g/cm³

Vapor Density:

>> 1.92

Vapor Pressure:

>> 0.00000008 [mmHg]

>> Vapor pressure at 20 °C: negligible

LogP:

>> log Kow = 1.33

>> 1.33

Stability/Shelf Life:

>> Stable under ordinary storage conditions but decomposes more or less rapidly when exposed to moisture or to acids. In presence of moisture decomposition proceeds as in nabam with formation of polymeric ethylene thiuram monosulfide. ... The biological activity of the product remains practically unvaried for 2 yr under environmental conditions, provided the product is stored in its unopened & undamaged original containers, in shaded & possible well-aired places.

Decomposition:

>> Decomposes without melting at 192-204 °C. ... Decomposes on prolonged exposure to air or moisture.

>> 192-204 °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

>> Highly flammable. Soluble in water. This material is likely to generate heat spontaneously, especially when wet. The heat may be sufficient to ignite the material. Thio and dithiocarbamates slowly decompose in aqueous solution to form carbon disulfide and methylamine or other amines. Such decompositions are accelerated by acids.

>> Highly Flammable

>> Water-Reactive

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

>> Maneb

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)

>> 3, not classifiable as to its carcinogenicity to humans. (L135)

Exposure Routes:

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

Inhalation Exposure

>> Cough. Sore throat.

Skin Exposure

>> Redness.

Eye Exposure

>> Redness. Pain.

Ingestion Exposure

>> Diarrhoea. Nausea. Vomiting.

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.

>> Neurotoxin - Parkinsonism

>> Nephrotoxin - The chemical is potentially toxic to the kidneys in the occupational setting.

>> 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.

Interactions:

>> Maneb has ... been shown to produce nigrostriatal degeneration when given in combination with paraquat ...

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/ Patch-tests on three volunteers who had reported adverse effects from treated plants demonstrated that maneb was a dermal sensitizer. A variable cross sensitization was observed to ammonium and sodium dithiocarbamates. None of the volunteers showed a cross sensitization to zineb.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Primary dermal irritation: Non-irritating (rabbit).

Non-Human Toxicity Values:

>> LD50 Rat oral 6750 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. 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.

>> SEDIMENT: Maneb was detected at 3.26-49 mg/kg in 16.67% of 12 sediment samples taken from Taihu Lake, China in 2000(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 mancozeb 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. Do NOT wash away into sewer. Sweep spilled substance into covered sealable containers. Carefully collect remainder. 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/

>> The following wastewater treatment technology has been investigated for maneb: Concentration process: Biological treatment.

>> 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.

>> 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.

>> 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

Maneb
4.2
UN Pack Group: III
Reportable Quantity of 5000 lb or 2270 kg

IATA

Maneb
4.2, 4.3
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

>> Maneb: Does not have an individual approval but may be used as a component in a product covered by a group standard. It is not approved for use as a chemical in its own right.

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 - Manganese, [[1,2-ethanediylbis(carbamodithioato)](2-)]-: Environment tier I assessment

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

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