ionz

SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Coumaphos
Catalog Number : io-2034
CAS Number : 56-72-4
Identified uses : Laboratory chemicals, manufacture of chemical compounds
Company : Ionz

>> R&D Use only

2. Hazards Identification

GHS Classification:

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

Pictogram(s)

GHS Hazard Statements

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

>> H311 (45.6%): Toxic in contact with skin [Danger Acute toxicity, dermal]

>> H312 (54.4%): Harmful in contact with skin [Warning Acute toxicity, dermal]

>> H400 (100%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (100%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P262, P264, P270, P273, P280, P301+P316, P302+P352, P316, P317, P321, P330, P361+P364, P362+P364, P391, P405, and P501

Health Hazards:

>> Very toxic, probable oral lethal dose is 50-500 mg/kg, or between 1 teaspoonful and 1 oz. for a 70 kg (150 lb.) person. May be fatal if inhaled, swallowed, or absorbed through skin. Contact may cause burns to skin and eyes. (EPA, 1998)

>> When heated to decomposition, it emits very toxic fumes of sulfur oxides, phosphorus oxides, and chlorides. Incompatible with piperonyl butoxide. Stable in water. (EPA, 1998)

>> Not combustible. Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire. Heating will cause rise in pressure with risk of bursting.

3. Composition/Information On Ingredients

Chemical name : Coumaphos
CAS Number : 56-72-4
Molecular Formula : C14H16ClO5PS
Molecular Weight : 362.8000 g/mol

4. First Aid Measures

First Aid:

>> Note: Coumaphos is a cholinesterase inhibitor.

>> Signs and Symptoms of Acute Coumaphos Exposure: Acute exposure to coumaphos may produce the following signs and symptoms: pinpoint pupils, blurred vision, headache, dizziness, muscle spasms, and profound weakness. Vomiting, diarrhea, abdominal pain, seizures, and coma may also occur. The heart rate may decrease following oral exposure or increase following dermal exposure. Hypotension (low blood pressure) and chest pain may be noted. Hypertension (high blood pressure) is not uncommon. Respiratory effects include dyspnea (shortness of breath), respiratory depression, and respiratory paralysis. Psychosis may occur.

>> Emergency Life-Support Procedures: Acute exposure to coumaphos may require decontamination and life support for the victims. Emergency personnel should wear protective clothing appropriate to the type and degree of contamination. Air-purifying or supplied-air respiratory equipment should also be worn, as necessary. Rescue vehicles should carry supplies such as plastic sheeting and disposable plastic bags to assist in preventing spread of contamination.

>> Inhalation Exposure:

>> 1. Move victims to fresh air. Emergency personnel should avoid self-exposure to coumaphos.

>> 2. Evaluate vital signs including pulse and respiratory rate, and note any trauma. If no pulse is detected, provide CPR. If not breathing, provide artificial respiration. If breathing is labored, administer oxygen or other respiratory support.

>> 3. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 4. Transport to a health care facility.

>> Dermal/Eye Exposure:

>> 1. Remove victims from exposure. Emergency personnel should avoid self- exposure to coumaphos.

>> 3. Remove contaminated clothing as soon as possible.

>> 4. If eye exposure has occurred, eyes must be flushed with lukewarm water for at least 15 minutes.

>> 5. Wash exposed skin areas three times with soap and water.

>> 6. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 7. Transport to a health care facility.

>> Ingestion Exposure:

>> 1. Evaluate vital signs including pulse and respiratory rate, and note any trauma. If no pulse is detected, provide CPR. If not breathing, provide artificial respiration. If breathing is labored, administer oxygen or other respiratory support.

>> 2. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 3. Vomiting may be induced with syrup of Ipecac. If elapsed time since ingestion of coumaphos is unknown or suspected to be greater than 30 minutes, do not induce vomiting and proceed to Step

>> 4.Ipecac should not be administered to children under 6 months of age.Warning: Ingestion of coumaphos may result in sudden onset of seizures or loss of consciousness. Syrup of Ipecac should be administered only if victims are alert, have an active gag-reflex, and show no signs of impending seizure or coma. If ANY uncertainty exists, proceed to Step

>> 4.The following dosages of Ipecac are recommended: children up to 1 year old, 10 mL (1/3 oz); children 1 to 12 years old, 15 mL (1/2 oz); adults, 30 mL (1 oz). Ambulate (walk) the victims and give large quantities of water. If vomiting has not occurred after 15 minutes, Ipecac may be readministered. Continue to ambulate and give water to the victims. If vomiting has not occurred within 15 minutes after second administration of Ipecac, administer activated charcoal.

>> 4. Activated charcoal may be administered if victims are conscious and alert. Use 15 to 30 g (1/2 to 1 oz) for children, 50 to 100 g (1-3/4 to 3-1/2 oz) for adults, with 125 to 250 mL (1/2 to 1 cup) of water.

>> 5. Promote excretion by administering a saline cathartic or sorbitol to conscious and alert victims. Children require 15 to 30 g (1/2 to 1 oz) of cathartic; 50 to 100 g (1-3/4 to 3-1/2 oz) is recommended for adults.

>> 6. Transport to a health care facility. (EPA, 1998)

First Aid Measures

Inhalation First Aid

>> Fresh air, rest. Artificial respiration may be needed. No mouth-to-mouth artificial respiration. Refer immediately for medical attention.

Skin First Aid

>> Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention .

Eye First Aid

>> First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Ingestion First Aid

>> Rinse mouth. Give a slurry of activated charcoal in water to drink. NO mouth-to-mouth artificial respiration. Refer immediately for medical attention.

5. Fire Fighting Measures

>> Use organic vapor respirator, rubber gloves, and goggles. Dike fire control water for disposal later.

>> This material may burn but does not ignite easily.

>> Extinguish with water, foam, carbon dioxide, or dry chemicals (EPA, 1998)

>> In case of fire in the surroundings, use appropriate extinguishing media. In case of fire: keep drums, etc., cool by spraying with water.

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 152 [Substances - Toxic (Combustible)]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

>> SPILL: Increase the immediate precautionary measure distance, in the downwind direction, as necessary.

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2024)

Spillage Disposal:

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Personal protection: particulate filter respirator adapted to the airborne concentration of the substance and protective clothing. Do NOT wash away into sewer. Collect the spilled substance into 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. Well closed. Keep in a well-ventilated room. Store in an area without drain or sewer access.

Storage Conditions:

>> Storage temperature: Ambient

8. Exposure Control/ Personal Protection

>> 0.05 [mg/m3], inhalable fraction and vapor

>> 0.05 mg/m

TLV-TWA (Time Weighted Average)

>> 0.05 mg/m³ (inhalable fraction and vapor) [2005]

Inhalation Risk:

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

Effects of Short Term Exposure:

>> Cholinesterase inhibition. The substance may cause effects on nervous system. The effects may be delayed. Medical observation is indicated.

Effects of Long Term Exposure:

>> Cholinesterase inhibition. Cumulative effects are possible. See Acute Hazards/Symptoms.

Exposure Prevention

>> PREVENT DISPERSION OF DUST! AVOID ALL CONTACT! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN! FIRST AID: USE PERSONAL PROTECTION.

Inhalation Prevention

>> Use local exhaust or breathing protection.

Skin Prevention

>> Protective gloves. Protective clothing.

Eye Prevention

>> Wear face shield or eye protection in combination with breathing protection.

Ingestion Prevention

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

Exposure Control and Personal Protection

Exposure Summary

>> Biological Exposure Indices (BEI) [ACGIH] - Acetylcholinesterase activity in red blood cells = 70% of individual's baseline; Butylcholinesterase activity in serum or plasma = 60% of individual's baseline; Sample at end of shift; [TLVs and BEIs]

9. Physical And Chemical Properties

Molecular Weight:

>> 362.8

Exact Mass:

>> 362.0144595

Physical Description:

>> Coumaphos appears as slightly brownish crystals with a slight sulfurous odor. Used for the control of a wide variety of livestock insects including cattle grubs, lice, scabies, flies, and ticks; the common ectoparasites of sheep, goats, horse, swine, and poultry as well as for screwworms in all these animals. (EPA, 1998)

>> COLOURLESS CRYSTALS WITH CHARACTERISTIC ODOUR.

Color/Form:

>> Colorless crystals

Odor:

>> Slight sulfur-like odor

Boiling Point:

>> 68 °F at 1e-07 mmHg (NTP, 1992)

Melting Point:

>> 196 °F (EPA, 1998)

>> 91 °C

Flash Point:

>> Not Applicable. Combustible solid. (USCG, 1999)

Solubility:

>> less than 1 mg/mL at 72 °F (NTP, 1992)

>> Solubility in water: none

Density:

>> 1.31 at 77 °F (EPA, 1998) - Denser than water; will sink

>> 1.47 g/cm³

Vapor Pressure:

>> 1e-07 mmHg at 68 °F (EPA, 1998)

>> Vapor pressure at 20 °C: negligible

LogP:

>> log Kow = 4.13

>> 4.13

Stability/Shelf Life:

>> Stable under recommended storage conditions.

Odor Threshold:

>> 2.0X10-2 ppm (Detection in water; purity not specified).

Collision Cross Section:

Collision cross section (CCS) represents the effective area for the interaction between an individual ion and the neutral gas through which it is traveling (e.g., in ion mobility spectrometry (IMS) experiments). It quantifies the probability of a collision taking place between two or more particles.

>> 204.34 Å² [M+Na]+

>> 180.5 Å² [M+H]+

>> 184.54 Å² [M-H]-

10. Stability And Reactivity

>> Insoluble in water. This compound hydrolyzes slowly under alkaline conditions.

11. Toxicological Information

Toxicity Summary:

>> IDENTIFICATION AND USE: Coumaphos is an organophosphate insecticide used for control of a wide variety of insects on cattle and parasitic mites (Varroa jacobson) on bees. It is also used in veterinary medicine for the treatment of screwworms, maggots, and ear ticks on livestock. Registered for use in the U.S., but approved pesticide uses may change periodically and so federal, state and local authorities must be consulted for currently approved uses. HUMAN EXPOSURE AND TOXICITY: The signs and symptoms of a human exposure to coumaphos are similar to general exposure to organophosphates: potent cholinesterase enzyme inhibitors that act by interfering with the metabolism of acetylcholine, which results in accumulation of acetylcholine at neuroreceptor transmission sites. Exposure produces a broad spectrum of clinical effects indicative of massive overstimulation of the chlorinergic system, including muscarinic effects (parasympathetic), nicotinic effects (sympathetic and motor), and CNS effects. These effects present clinically as feeling of headache, weakness, dizziness, blurred vision, psychosis, respiratory difficulty, paralysis, convulsions, and coma. According to case reports, human exposure can occur due to accidental ingestion from contaminated food, intentional ingestion or inhalation. ANIMAL STUDIES: Dermal administration of single (50-500 mg/kg) or daily (100 mg/kg) doses of coumaphos resulted in delayed neurotoxicity in hens. Coumaphos caused loss of weight and produced ataxia, which progressed to paralysis and death. Some hens given a single oral 50 mg/kg dose or daily 5 mg/kg doses of coumaphos recovered from the initial cholinergic effect and developed clinical signs of delayed neurotoxicity. A bioassay of coumaphos for possible carcinogenicity was conducted by administering the test chemical in feed to rats and mice. In both rats and mice, no tumors occurred in the dosed groups of either sex at incidences that were significantly higher than those in corresponding control groups. Weekly spraying at concentration of 200-400 ppm or weekly dipping in solution containing 200 ppm for 2 year period had no adverse effect on cattle. ECOTOXICITY STUDIES: In water fowl exposed to coumaphos, signs appeared as soon as 40 min in mallard ducks and 90 min in pheasants and mortalities usually occurred between 2 and 3 hour after treatment. Recovery took up to 14 days.

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

>> Coumaphos

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

>> 0.0025

Acute or One Day HHBPs [ppb]

>> 17

Acute HHBP Sensitive Lifestage/Population

>> Children

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

>> 0.0003

Chronic or One Day HHBPs [ppb]

>> 2

Chronic HHBP Sensitive Lifestage/Population

>> General Population

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).

>> Cancer Classification: Not Likely to be Carcinogenic to Humans

Carcinogen Classification:

This section provides the International Agency for Research on Cancer (IARC) Carcinogenic Classification and related monograph links. In the IARC Carcinogenic classification, chemicals are categorized into four groups: Group 1 (carcinogenic to humans), Group 2A (probably carcinogenic to humans), Group 2B (possibly carcinogenic to humans), and Group 3 (not classifiable as to its carcinogenicity to humans).

>> No indication of carcinogenicity to humans (not listed by IARC).

Health Effects:

>> Acute exposure to cholinesterase inhibitors can cause a cholinergic crisis characterized by severe nausea/vomiting, salivation, sweating, bradycardia, hypotension, collapse, and convulsions. Increasing muscle weakness is a possibility and may result in death if respiratory muscles are involved. Accumulation of ACh at motor nerves causes overstimulation of nicotinic expression at the neuromuscular junction. When this occurs symptoms such as muscle weakness, fatigue, muscle cramps, fasciculation, and paralysis can be seen. When there is an accumulation of ACh at autonomic ganglia this causes overstimulation of nicotinic expression in the sympathetic system. Symptoms associated with this are hypertension, and hypoglycemia. Overstimulation of nicotinic acetylcholine receptors in the central nervous system, due to accumulation of ACh, results in anxiety, headache, convulsions, ataxia, depression of respiration and circulation, tremor, general weakness, and potentially coma. When there is expression of muscarinic overstimulation due to excess acetylcholine at muscarinic acetylcholine receptors symptoms of visual disturbances, tightness in chest, wheezing due to bronchoconstriction, increased bronchial secretions, increased salivation, lacrimation, sweating, peristalsis, and urination can occur. Certain reproductive effects in fertility, growth, and development for males and females have been linked specifically to organophosphate pesticide exposure. Most of the research on reproductive effects has been conducted on farmers working with pesticides and insecticdes in rural areas. In females menstrual cycle disturbances, longer pregnancies, spontaneous abortions, stillbirths, and some developmental effects in offspring have been linked to organophosphate pesticide exposure. Prenatal exposure has been linked to impaired fetal growth and development. Neurotoxic effects have also been linked to poisoning with OP pesticides causing four neurotoxic effects in humans: cholinergic syndrome, intermediate syndrome, organophosphate-induced delayed polyneuropathy (OPIDP), and chronic organophosphate-induced neuropsychiatric disorder (COPIND). These syndromes result after acute and chronic exposure to OP pesticides.

Exposure Routes:

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

Inhalation Exposure

>> Headache. Sweating. Weakness. Nausea. Vomiting. Pupillary constriction, muscle cramp, excessive salivation. Laboured breathing. Unconsciousness.

Skin Exposure

>> MAY BE ABSORBED! Further see Inhalation.

Eye Exposure

>> Redness.

Ingestion Exposure

>> Abdominal cramps. Diarrhoea. Further see Inhalation.

>> Symptoms of low dose exposure include excessive salivation and eye-watering. Acute dose symptoms include severe nausea/vomiting, salivation, sweating, bradycardia, hypotension, collapse, and convulsions. Increasing muscle weakness is a possibility and may result in death if respiratory muscles are involved. Hypertension, hypoglycemia, anxiety, headache, tremor and ataxia may also result.

Adverse Effects:

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

>> Other Poison - Organophosphate

>> ACGIH Carcinogen - Not Classifiable.

Toxicity Data:

>> LC50 (rat) = 303 mg/m3

Treatment:

Treatment when exposed to toxin

>> If the compound has been ingested, rapid gastric lavage should be performed using 5% sodium bicarbonate. For skin contact, the skin should be washed with soap and water. If the compound has entered the eyes, they should be washed with large quantities of isotonic saline or water. In serious cases, atropine and/or pralidoxime should be administered. Anti-cholinergic drugs work to counteract the effects of excess acetylcholine and reactivate AChE. Atropine can be used as an antidote in conjunction with pralidoxime or other pyridinium oximes (such as trimedoxime or obidoxime), though the use of '-oximes' has been found to be of no benefit, or possibly harmful, in at least two meta-analyses. Atropine is a muscarinic antagonist, and thus blocks the action of acetylcholine peripherally.

Antidote and Emergency Treatment:

>> A 32 yr old male with acute coumaphos poisoning ... the organophosphate poisoning was successfully managed by artificial ventilation, an infusion of pralidoxime and intermittent atropine. ...

Human Toxicity Excerpts:

>> /SIGNS AND SYMPTOMS/ A 32-year-old male with acute organophosphate /coumaphos/ poisoning developed hyperglycaemia, glycosuria and ketonuria soon after admission to hospital. Serum amylase estimations suggested a diagnosis of acute pancreatitis. ...

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Determination of the acute oral medial lethal dose (LD50) of haloxon for lambs classified as to the presence or absence of plasma esterases (A esterase; EsA) rapidly hydrolyzing haloxon revealed markedly different values for the 2 phenotypes of sheep. The LD50 for EsA- lambs was 763 mg/kg of body weight with 95% confidence limits of 543 to 1,072 mg/kg. The acute oral LD50 for EsA+ lambs remains undetermined but was demonstrated to be in excess of 11,392 mg/kg. The acute oral LD50 for a closely related organophosphate (coumaphos) was not different in the 2 phenotypes of sheep.

Human Toxicity Values:

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

>> A 32-year-old male with acute organophosphate poisoning /was admitted/ to /the/ hospital. ... /The ingested dose of coumaphos (0,0-diethyl-0-3-chloro- 4-methyl-2-oxo-2H-1-benzopyran-7-yl phosphorothioate) was estimated to be 14 g. The calculated /lethal dose/ for this man who weighed 85 kg was 1275 g (15 mg/kg)./

Non-Human Toxicity Values:

>> LD50 Rabbit (male) dermal 500 mg/kg

National Toxicology Program Studies:

Reports from the National Toxicology Program, an interagency program supported by three government agencies (NIH, FDA, and CDC) within the Department of Health and Human Services. This program plays a critical role in generating, interpreting, and sharing toxicological information about chemicals of public health concerns.

>> A bioassay of coumaphos for possible carcinogenicity was conducted by administering the test chemical in feed to F344 rats and B6C3F1 mice. Groups of 50 rats of each sex and 50 mice of each sex were administered the coumaphos in the diet at one of two doses, either 10 or 20 ppm, for 103 wk and then observed for 0-1 additional wk. Matched controls consisted of groups of 25 untreated animals of each species and sex. All surviving animals were /sacrificed/ at 103-105 wk. ... Under the conditions of this bioassay, coumaphos was not carcinogenic in F344 rats or B6C3F1 mice. Levels of Evidence of Carcinogenicity: Male Rats: Negative; Female Rats: Negative; Male Mice: Negative; Female Mice: Negative.

12. Ecological Information

ICSC Environmental Data:

>> The substance is very toxic to aquatic organisms. This substance may be hazardous to the environment. Special attention should be given to fish, crustacea, birds and mammals. Bioaccumulation of this chemical may occur in fish. 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: Coumaphos was not reported in soil samples from 35 sites in South Shenyang, China; samples were collected Jun 2010(1).

Fish/Seafood Concentrations:

Concentrations of this compound in fish or seafood.

>> Coumaphos was detected in mosquitofish, Gambusia affinis, from a rice crop field in the Ebro Delta, Spain in September and February at concentrations of approximately 125 and 150 ng/g wet weight, respectively(1).

Animal Concentrations:

Concentrations of this compound in animals.

>> Coumaphos was detected in 22 of 92 honeybee (Apis mellifera) samples from the district of Bologna, Italy at concentrations of 0.002 to 2.777 mg/kg; dead bee samples were collected in bags suspended under beehives (only worker bees were analyzed)(1).

13. Disposal Considerations

Spillage Disposal

>> Personal protection: particulate filter respirator adapted to the airborne concentration of the substance and protective clothing. Do NOT wash away into sewer. Collect the spilled substance into containers. If appropriate, moisten first to prevent dusting. Then store and dispose of according to local regulations.

Disposal Methods

>> SRP: The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational harm/injury/toxicity or environmental contamination. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in soil or water; effects on animal and plant life; and conformance with environmental and public health regulations.

14. Transport Information

DOT

Coumaphos
6.1
UN Pack Group: II
Reportable Quantity of 10 lb or 4

IATA

Coumaphos
6.1,
UN Pack Group: II

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.

>> Coumaphos is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.

Regulatory Information

New Zealand EPA Inventory of Chemical Status

>> Coumaphos: HSNO Approval: HSR002829 Approved with controls

16. Other Information

Toxic Combustion Products:

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

>> Toxic & irritating oxides of sulfur & phosphorus may form in fire.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Phosphorothioic acid, O-(3-chloro-4-methyl-2-oxo-2H-1-benzopyran-7-yl) O,O-diethyl ester: Environment tier I assessment

>> IMAP assessments - Phosphorothioic acid, O-(3-chloro-4-methyl-2-oxo-2H-1-benzopyran-7-yl) O,O-diethyl ester: Human health tier I assessment

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