SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Chlormequat chloride
Catalog Number : io-1955
CAS Number : 999-81-5
Identified uses : Laboratory chemicals, manufacture of chemical compounds
Company : Ionz

>> R&D Use only

2. Hazards Identification

GHS Classification:

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

Pictogram(s)

>> Warning

GHS Hazard Statements

>> H302 (84.8%): Harmful if swallowed [Warning Acute toxicity, oral]

>> H312 (99.4%): Harmful in contact with skin [Warning Acute toxicity, dermal]

>> H332 (15.2%): Harmful if inhaled [Warning Acute toxicity, inhalation]

Precautionary Statement Codes

>> P261, P264, P270, P271, P280, P301+P317, P302+P352, P304+P340, P317, P321, P330, P362+P364, and P501

Health Hazards:

>> Inhalation of spray and prolonged or repeated contact with skin should be avoided. (EPA, 1998)

>> Flash point data for this chemical are not available; however, it is probably combustible. (NTP, 1992)

>> Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.

3. Composition/Information On Ingredients

Chemical name : Chlormequat chloride
CAS Number : 999-81-5
Molecular Formula : C5H13Cl2N
Molecular Weight : 158.0700 g/mol

4. First Aid Measures

First Aid:

>> Signs and Symptoms of Chlormequat Chloride Exposure: No information on specific clinical effects of exposure to chlormequat chloride was found in available references. However, because chlormequat chloride is expected to be corrosive, irritation and burning of the skin, eyes, and mucous membranes may be noted. Light-headedness, drowsiness, slurred speech, pupillary dilation, increased salivation, dysphagia (difficulty swallowing), abdominal pain, and spontaneous vomiting may occur. Stridor (high pitched, noisy respirations), dyspnea (shortness of breath), and pulmonary edema may occur. Apathy and mental confusion may develop, with progression to coma and death.

>> Emergency Life-Support Procedures: Acute exposure to chlormequat chloride 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 chlormequat chloride.

>> 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. Rush to a health care facility.

>> Dermal/Eye Exposure:

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

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

>> 4. If eye exposure has occurred, eyes must be flushed with lukewarm water for at least 30 minutes.

>> 5. Wash exposed skin areas thoroughly with water.

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

>> 7. Rush 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. DO NOT induce vomiting or attempt to neutralize!

>> 4. Activated charcoal is of no value.

>> 5. Give the victims water or milk: children up to 1 year old, 125 mL (4 oz or 1/2 cup); children 1 to 12 years old, 200 mL (6 oz or 3/4 cup); adults, 250 mL (8 oz or 1 cup). Water or milk should be given only if victims are conscious and alert.

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

First Aid Measures

Inhalation First Aid

>> Fresh air, rest.

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. Refer for medical attention .

5. Fire Fighting Measures

>> (Non-Specific -- Poisonous Solid, n.o.s.) For small fires, use dry chemical, carbon dioxide, water spray, or foam. For large fires, use water spray, fog, or foam. (EPA, 1998)

>> In case of fire in the surroundings, use appropriate extinguishing media.

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 154 [Substances - Toxic and/or Corrosive (Non-Combustible)]:

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

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

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

Spillage Disposal:

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

>> Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. Carefully collect remainder. Then store and dispose of according to local regulations.

7. Handling And Storage

Safe Storage:

>> Dry. Keep in a well-ventilated room. Store in glass, high-density plastic, rubber or epoxy resin-protected metal containers.

Storage Conditions:

>> Pesticide Storage: Store in original container. DO NOT store below freezing temperatures.

8. Exposure Control/ Personal Protection

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 aerosol is mildly irritating to the eyes. The substance may cause effects on the nervous system, cholinergic symptoms without acetylcholinesterase inhibition.

Exposure Prevention

>> PREVENT DISPERSION OF DUST! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!

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.

9. Physical And Chemical Properties

Molecular Weight:

>> 158.07

Exact Mass:

>> 157.0425048

Physical Description:

>> Chlormequat chloride appears as white crystals with a fishlike odor. Used as a plant growth regulator. Said to be effective for cereal grains, tomatoes, and peppers. (EPA, 1998)

>> COLOURLESS-TO-WHITE EXTREMELY HYGROSCOPIC CRYSTALS WITH CHARACTERISTIC ODOUR.

Color/Form:

>> White cyrstalline solid

Odor:

>> TYPICAL AMINE ODOR

Melting Point:

>> 473 °F Decomposes (EPA, 1998)

Solubility:

>> greater than or equal to 100 mg/mL at 73 °F (NTP, 1992)

>> Solubility in water, g/100ml at 20 °C: 74 (good)

Density:

>> 1.14 to 1.15 g/mL at 20 °C

Vapor Pressure:

>> 7.5e-08 mmHg at 68 °F (NTP, 1992)

>> Vapor pressure at 20 °C: negligible

LogP:

>> log Kow = -3.80

Stability/Shelf Life:

>> Stable up to 50 °C for at least 2 years.

Decomposition:

>> 245 °C

Corrosivity:

The ability of a chemical to damage or destroy other substances when it comes into contact.

>> Aqueous solutions are corrosive to metal

pH:

pH is an expression of hydrogen ion concentration in water. Specifically, pH is the negative logarithm of hydrogen ion (H+) concentration (mol/L) in an aqueous solution. The term is used to indicate basicity or acidity of a solution on a scale of 0 to 14, with pH 7 being neutral.

>> pH = 5.14

Surface Tension:

>> 70.3 mN/m

10. Stability And Reactivity

>> Very hygroscopic. Water soluble. Aqueous solutions are acidic.

11. Toxicological Information

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

>> Chlormequat chloride

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

>> 1

Acute or One Day HHBPs [ppb]

>> 7000

Acute HHBP Sensitive Lifestage/Population

>> Children

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

>> 0.05

Chronic or One Day HHBPs [ppb]

>> 300

Chronic HHBP Sensitive Lifestage/Population

>> General Population

Reference (PDF)

>> Human Health Benchmarks for Pesticides - 2021 Update

Exposure Routes:

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

Inhalation Exposure

>> See Ingestion.

Skin Exposure

>> MAY BE ABSORBED!

Eye Exposure

>> Redness.

Ingestion Exposure

>> Excessive salivation. Sweating. Diarrhoea. Dizziness. Headache. Laboured breathing. Nausea. Pupillary constriction.

Adverse Effects:

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

>> Neurotoxin - Other CNS neurotoxin

Toxicity Data:

>> LC50 (rat) > 5,200 mg/m3/4h

Antidote and Emergency Treatment:

>> Immediate first aid: 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 if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on the 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. /Poisons A and B/

Human Toxicity Excerpts:

>> /CASE REPORTS/ The suicide of a young man with the plant growth regulator Cycocel (chlorocholine chloride and choline chloride) is reported. Morphological and toxicological findings are presented...

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Acutely toxic doses of CCC cause lacrimation, salivation, and intestinal motility, and although these signs of toxicity of CCC in mammals resemble those of anticholinesterase agents, the chemical does not inhibit cholinesterase. These effects are produced by stimulation at muscarinic receptors and are partially antagonized by low doses of atropine, a cholinergic blocking agent which specifically blocks muscarinic receptors. Lethal doses cause respiratory failure that is due to neuromuscular blockage and that is unaffected by atropine treatment.

Non-Human Toxicity Values:

>> LD50 Rat oral 330-750 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 (2-chloroethyl)trimethylammonium chloride for possible carcinogenicity was conducted by administering the test chemical in feed to F344 rats. Groups of 50 rats of each sex were administered either 1500 or 3000 ppm of the compound for 108 weeks. Matched controls consisted of 20 untreated rats. Mean body weights of dosed rats were lower than those of corresponding controls for part or all of the bioassay. Survival was not affected significantly in any of the dosed groups of rats, and was at least 64% in dosed or control groups at the end of the bioassay. Sufficient numbers of dosed and control rats of each sex were at risk for the development of late-appearing tumors. No tumors occurred in the rats of either sex at incidences that could be associated with administration of the test chemical. It is concluded that under the conditions of this bioassay, (2-chloroethyl)trimethylammonium chloride was not carcinogenic for F344 rats of either sex.

12. Ecological Information

ICSC Environmental Data:

>> The substance is harmful to aquatic organisms. Avoid release to the environment in circumstances different to normal use.

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 containers. Carefully collect remainder. Then store and dispose of according to local regulations.

Disposal Methods

>> Pesticide Disposal: Wastes resulting from the /agricultural/ use of this product may be disposed of on site or at an approved waste disposal facility. Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning or puncture and dispose of in /accordance with local, state, and Federal laws/.

>> This crystalline, water-soluble solid melts at 245 °C with decomp. Incineration is a highly effective disposal method. Heating the product with strong aqueous alkali would result in decomp with the evolution of trimethylamine and other gaseous products. Recommendable method: Incineration. Peer-review: Incinerate in a unit with effluent gas scrubbing. (Peer-review conclusions of an IRPTC expert consultation (May 1985))

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

14. Transport Information

DOT

Chlormequat chloride

IATA

Chlormequat chloride

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15. Regulatory Information

Regulatory Information

New Zealand EPA Inventory of Chemical Status

>> Chlormequat chloride: Does not have an individual approval but may be used under an appropriate group standard

16. Other Information

Toxic Combustion Products:

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

>> The substance decomposes on heating producing toxic and corrosive fumes including nitrogen oxides, hydrogen chloride. The substance decomposes on heating with strong aqueous alkali solutions producing trimethylamine and other gaseous products.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Ethanaminium, 2-chloro-N,N,N-trimethyl-, chloride: Environment tier I assessment

>> IMAP assessments - Ethanaminium, 2-chloro-N,N,N-trimethyl-, chloride: Human health tier I assessment

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