SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Diphacinone
Catalog Number : io-2285
CAS Number : 82-66-6
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)

GHS Hazard Statements

>> H300+H310 (100%): Fatal if swallowed or in contact with skin [Danger Acute toxicity, oral; acute toxicity, dermal]

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

>> H310 (100%): Fatal in contact with skin [Danger Acute toxicity, dermal]

>> H332 (100%): Harmful if inhaled [Warning Acute toxicity, inhalation]

>> H372 (100%): Causes damage to organs through prolonged or repeated exposure [Danger Specific target organ toxicity, repeated exposure]

Precautionary Statement Codes

>> P260, P261, P262, P264, P270, P271, P280, P301+P316, P302+P352, P304+P340, P316, P317, P319, P321, P330, P361+P364, P405, and P501

Health Hazards:

>> This material is extremely toxic; probable oral lethal dose in humans is 5-50 mg/kg, or between 7 drops and 1 teaspoonful for a 150-lb. person. Many medical conditions will be aggravated by this material. (EPA, 1998)

>> When heated to decomposition it emits acrid smoke and fumes. Sensitive to light. (EPA, 1998)

>> Combustible.

3. Composition/Information On Ingredients

Chemical name : Diphacinone
CAS Number : 82-66-6
Molecular Formula : C23H16O3
Molecular Weight : 340.4000 g/mol

4. First Aid Measures

First Aid:

>> Signs and Symptoms of Acute Diphacinone Exposure: Diphacinone is an anticoagulant. Hemorrhage is the most common effect and may be manifested by nose bleeding, gum bleeding, bloody stools and urine, ecchymoses (extravasations of blood into skin), and hemoptysis (coughing up of blood). Bruising is heightened. Abdominal and flank pain are also common. Other signs and symptoms include flushing, dizziness, hypotension (low blood pressure), dyspnea (shortness of breath), cyanosis (blue tint to the skin and mucous membranes), fever, and diarrhea.

>> Emergency Life-Support Procedures: Acute exposure to diphacinone 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 diphacinone.

>> 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 diphacinone.

>> 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 twice 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. 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. 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 diphacinone 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 diphacinone 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. RUSH to a health care facility. (EPA, 1998)

First Aid Measures

Inhalation First Aid

>> Refer immediately for medical attention.

Skin First Aid

>> Wear protective gloves when administering first aid. Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer immediately for medical attention.

Eye First Aid

>> Rinse with plenty of water (remove contact lenses if easily possible).

Ingestion First Aid

>> Rinse mouth. Give a slurry of activated charcoal in water to drink. Refer immediately for medical attention.

5. Fire Fighting Measures

>> (Non-Specific -- Coumarin Derivative Pesticide, Solid, n.o.s.) Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. Ventilate closed spaces before entering them. Wear positive pressure breathing apparatus and special protective clothing. Remove and isolate contaminated clothing at the site.

>> The material is similar to coumarin and indandione. (Non-Specific -- Coumarin Derivative Pesticide, Solid, n.o.s.) Small fires: dry chemical, carbon dioxide, water spray, or foam. Large fires: water spray, fog, or foam. Move container from fire area if you can do it without risk. Fight fire from maximum distance. Dike fire control water for later disposal; do not scatter the material. (EPA, 1998)

>> Use water spray, 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 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: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Sweep spilled substance into containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Store and dispose of according to local regulations.

7. Handling And Storage

Safe Storage:

>> Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs. Well closed. Store in an area without drain or sewer access.

8. Exposure Control/ Personal Protection

Inhalation Risk:

>> A harmful concentration of airborne particles can be reached quickly when dispersed.

Effects of Short Term Exposure:

>> The substance may cause effects on the blood. This may result in bleeding. The effects may be delayed. Medical observation is indicated. Exposure could cause death.

Effects of Long Term Exposure:

>> The substance may have effects on the blood. This may result in bleeding.

Fire Prevention

>> NO open flames.

Exposure Prevention

>> AVOID ALL CONTACT! PREVENT DISPERSION OF DUST! IN ALL CASES CONSULT A DOCTOR! FIRST AID: USE PERSONAL PROTECTION.

Inhalation Prevention

>> Use closed system.

Skin Prevention

>> Protective gloves. Protective clothing.

Eye Prevention

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

Ingestion Prevention

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

9. Physical And Chemical Properties

Molecular Weight:

>> 340.4

Exact Mass:

>> 340.109944368

Physical Description:

>> Diphacinone appears as odorless pale yellow crystals. Used as a rodenticide and anticoagulant medication. (EPA, 1998)

>> YELLOW-TO-WHITE CRYSTALS.

Color/Form:

>> Yellow crystals

Odor:

>> Odorless

Melting Point:

>> 295 to 297 °F (EPA, 1998)

>> 147 °C

Solubility:

>> In water, 0.3 mg/L, temp not specified

>> Solubility in water: very poor

Density:

>> Bulk density: 1.87 g/mL

>> 1.3 g/cm³

Vapor Pressure:

>> VP: 1.2X10-8 mm Hg

>> Vapor pressure, Pa at 25 °C: (negligible)

LogP:

>> log Kow = 4.27

>> 4.3

Stability/Shelf Life:

>> Sensitive to light

Decomposition:

>> When heated to decomposition it emits acrid smoke and fumes.

>> 338 °C

Corrosivity:

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

>> NON-CORROSIVE

Refractive Index:

>> Index of refraction: 1.670 C/D

Dissociation Constants:

>> Acidic, forming water soluble alkali metal salts

10. Stability And Reactivity

>> Practically insoluble in water (17mg/L). Hydrolyzed by strong acid.

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

>> Diphacinone

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

>> 0.002

Acute or One Day HHBPs [ppb]

>> 10

Acute HHBP Sensitive Lifestage/Population

>> Children

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

>> Coughing up blood. Blood in the urine. Bleeding under the skin. Symptoms may be delayed.

Skin Exposure

>> EASILY ABSORBED! See Inhalation.

Ingestion Exposure

>> Abdominal pain. Further see Inhalation.

Toxicity Data:

>> LC50 (rat) = 2000 mg/m3/4H

Interactions:

>> Frequently cited interactions that enhance the risk of hemorrhage in patients taking oral anticoagulants incl decrease metabolism due to CYP2C9 inhibition by amiodarone, azole antifungals, cimetidine, clopidogrel, cotrimoxazole, disulfiram, flouxetine, isoniazid, metronidazole, sulfinpyrazone, tolcapone, or zafirlukast, and displacement from protein binding sites caused by loop diuretics or valproate. ...Consequently, antibiotics can cause excessive PT prolongation in patients adequately controlled on /oral anticoagulants/.

Antidote and Emergency Treatment:

>> Administration of vitamin K1, SC, to anticoagulant-poisoned (diphenadione) dogs provided diagnostic information within 4 hours, when vitamin K1 and its epoxide were measured in canine sera. Twelve dogs (2 groups of 6) were given 2.5 mg of diphenadione/kg of body weight for 3 days. Dogs were treated with vitamin K1, 2.5 (n = 6) or 5 mg/kg/day (n = 6) SC for 21 days, and their responses were compared. Four nonexposed control dogs were given 5 mg of vitamin K1/kg/day. Serum concentration of vitamin K epoxide was significantly (P less than 0.02) higher in diphenadione-exposed dogs than in control dogs 1 to 4 hours after the initial vitamin K1 treatment on day 4. Vitamin K epoxide/vitamin K1 ratios were similarly higher and became more distinct. Cessation of vitamin K1 therapy on day 24 resulted in prolongation of one-stage prothrombin times in diphenadione-exposed dogs, becoming clearly evident on day 27. Serum vitamin K1 concentrations were not detectable on day 27 in diphenadione-exposed dogs, whereas serum vitamin K1 concentrations were readily detectable in control dogs. One-stage prothrombin time changes, during days 24 to 32, indicated 5 mg of vitamin K1/kg provided better protection than did 2.5 mg of vitamin K1/kg. Coagulopathy in the dogs was resolved by day 32.

Human Toxicity Excerpts:

>> /HUMAN EXPOSURE STUDIES/ No permanent or life-threatening effects occurred in humans on recommended dose regimes of an initial 20 mg dose (ca. 0.29 mg/kg in a 70 kg human), followed by successive 2 to 4 mg daily doses (ca. 0.03 to 0.06 mg/kg/day in a 70 kg person) for several days to weeks /Former use/.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Multiple dose toxicity ... /of diphenadione/ involves same hemorrhagic phenomenas with hydroxycoumarins. Massive single oral doses /100-200 mg/kg/ ... killed rats and rabbits within 2-12 hr. In ... acute exposures hemorrhages were not usually found on postmortem exam, and prothrombin levels were not invariably depressed.

Non-Human Toxicity Values:

>> LD50 Rat oral 0.3 to 2.3 mg/kg

Populations at Special Risk:

>> SRP: Persons with bleeding disorders or who are taking anticoagulants should be protected from exposure.

12. Ecological Information

ICSC Environmental Data:

>> The substance is 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.

Animal Concentrations:

Concentrations of this compound in animals.

>> Fifty one incidences of poisoning by anticoagulant rodenticides were documented in wildlife submitted for diagnosis by the public between 1971 and 1997 in New York and two adjoining states. Diphacinone was identified in the livers of 1 snowy owl (Nyctea scandiaca), 2 white-tailed deer (Odocoileus virginianus), and 1 gray squirrel (Sciurus carolinensis) at concentrations ranging from 0.2 - 0.93 ppm (1). Diphacinone was detected at a concentration range of 0.008 - 0.02 ppm (wet-wt) in livers from 8 of 164 barn owls (Tyto alba), barred owls (Strix varia), and great horned owls (Bubo virginianus) collected in the province of British Columbia and the Yukon Territory, Canada from 1988 to 2003(2).

13. Disposal Considerations

Spillage Disposal

>> Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Sweep spilled substance into containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. 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

Diphacinone
6.1
UN Pack Group: I

IATA

Diphacinone
6.1,
UN Pack Group: I

15. Regulatory Information

Regulatory Information

New Zealand EPA Inventory of Chemical Status

>> Diphacinone: HSNO Approval: HSR002774 Approved with controls

16. Other Information

Toxic Combustion Products:

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

>> Hazardous decomposition products formed under fire conditions. - Carbon oxides

"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."