SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Cadmium acetate
Catalog Number : io-1896
CAS Number : 543-90-8
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 (100%): Harmful if swallowed [Warning Acute toxicity, oral]

>> H312 (100%): Harmful in contact with skin [Warning Acute toxicity, dermal]

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

>> 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

>> P261, P264, P270, P271, P273, P280, P301+P317, P302+P352, P304+P340, P317, P321, P330, P362+P364, P391, and P501

Health Hazards:

>> Inhalation causes coughing, sneezing, symptoms of lung damage. Ingestion produces severe toxic symptoms; both kidney and liver injuries may occur. Contact with dust causes eye irritation. (USCG, 1999)

>> Special Hazards of Combustion Products: Toxic cadmium oxide fumes may form in fires. (USCG, 1999)

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

3. Composition/Information On Ingredients

Chemical name : Cadmium acetate
CAS Number : 543-90-8
Molecular Formula : C4H6CdO4
Molecular Weight : 230.5000 g/mol

4. First Aid Measures

First Aid:

>> INHALATION: remove victim to fresh air; seek medical attention.

>> INGESTION: induce vomiting; allay gastrointestinal irritation by swallowing milk or egg whites at frequent intervals; perform gastric lavage; seek medical attention.

>> EYES: flush with water for at least 15 min. (USCG, 1999)

First Aid Measures

Inhalation First Aid

>> Fresh air, rest.

Skin First Aid

>> Remove contaminated clothes. Rinse skin with plenty of water or shower.

Eye First Aid

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

Ingestion First Aid

>> Rinse mouth. Give one or two glasses of water to drink.

5. Fire Fighting Measures

>> Excerpt from ERG Guide 154 [Substances - Toxic and/or Corrosive (Non-Combustible)]:

>> SMALL FIRE: Dry chemical, CO2 or water spray.

>> LARGE FIRE: Dry chemical, CO2, alcohol-resistant foam or water spray. If it can be done safely, move undamaged containers away from the area around the fire. Dike runoff from fire control for later disposal.

>> FIRE INVOLVING TANKS, 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. 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)

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

7. Handling And Storage

Safe Storage:

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

Storage Conditions:

>> Ambient /temperature/.

8. Exposure Control/ Personal Protection

>> 0.005 [mg/m3], as Cd, see 29 CFR 1910.1027

>> 0.01 [mg/m3], as Cd (0.002 mg/m3, as Cd, respirable fraction)

>> (as Cd, respirable fraction): 0.002 mg/m

Inhalation Risk:

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

Effects of Long Term Exposure:

>> The substance may have effects on the kidneys and bones. This may result in kidney impairment and osteoporosis (bone weakness). This substance is carcinogenic to humans.

Exposure Prevention

>> PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!

Inhalation Prevention

>> Use closed system.

Skin Prevention

>> Protective gloves.

Eye Prevention

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

Ingestion Prevention

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

Exposure Control and Personal Protection

Exposure Summary

>> Biological Exposure Indices (BEI) [ACGIH] - Cd in urine = 5 ug/g creatinine; Cd in blood = 5 ug/L; sampling time not critical; Monitoring in blood should be preferred during the initial year of exposure and whenever changes in the degree of exposure are suspected. [ACGIH]

>> TIH (Toxic Inhalation Hazard) - Term used to describe gases and volatile liquids that are toxic when inhaled. Some are TIH materials themselves, e.g., chlorine, and some release TIH gases when spilled in water, e.g., chlorosilanes. [ERG 2016].

9. Physical And Chemical Properties

Molecular Weight:

>> 230.50

Exact Mass:

>> 231.929974

Physical Description:

>> Cadmium acetate is an odorless colorless solid. Sinks and mixes with water. (USCG, 1999)

>> COLOURLESS CRYSTALS WITH CHARACTERISTIC ODOUR.

Color/Form:

>> Colorless crystals

Odor:

>> Odor of acetic acid

Melting Point:

>> 255 °C

>> 255 °C

Solubility:

>> Soluble in water, ethanol

>> Solubility in water: very good

Density:

>> 2.34 at 68 °F (USCG, 1999) - Denser than water; will sink

>> 2.34 g/cm³

Stability/Shelf Life:

>> STABILITY DURING TRANSPORT: STABLE.

Decomposition:

>> When heated to decomposition it emits toxic fumes of cadmium.

10. Stability And Reactivity

>> Slowly oxidized by moist air to form cadmium oxide [Merck 11th ed. 1989]. Water soluble.

11. Toxicological Information

Toxicity Summary:

>> Cadmium initially binds to metallothionein and is transported to the kidney. Toxic effects are observed once the concentration of cadmium exceeds that of available metallothionein, and it has also been shown that the cadmium-metallothionein complex may be damaging. Accumulation of cadmium in the kidney results in increased excretion of vital low and high weight molecular proteins. Cadmium is a high affinity zinc analog and can interfere in its biological processes. It also binds to and activates the estrogen receptor, likely stimulating the growth of certain types of cancer cells and causing other estrogenic effects, such as reproductive dysfunction. Cadmium causes cell apoptosis by activating mitogen-activated protein kinases. (L8, A18, A19, A28)

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).

>> Evaluation: There is sufficient evidence in humans for the carcinogenicity of cadmium and cadmium compounds. There is sufficient evidence in experimental animals for the carcinogenicity of cadmium compounds. There is limited evidence in experimental animals for the carcinogenicity of cadmium metal. In making the overall evaluation, the Working Group took into consideration the evidence that ionic cadmium causes genotoxic effects in a variety of types of eukaryotic cells, including human cells. Overall evaluation: Cadmium and cadmium compounds are carcinogenic to humans (Group 1). /Cadmium and cadmium compounds/

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).

>> 1, carcinogenic to humans. (L135)

Health Effects:

>> Chronic exposure to cadmium fumes can cause chemical pneumonitis, pulmonary edema, and lung diseases such as bronchitis and emphysema. Cadmium also accumulates in the kidneys, causing permanent damage. Loss of bone density also occurs. (L6)

Exposure Routes:

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

>> Oral (L6) ; inhalation (L6) ; dermal (L6)

Inhalation Exposure

>> Cough.

Eye Exposure

>> Redness.

Ingestion Exposure

>> Abdominal pain. Nausea. Vomiting.

>> Acute inhalation of cadmium fumes results in metal fume fever, which is characterized by chills, fever, headache, weakness, dryness of the nose and throat, chest pain, and coughing. Ingestion of cadmium causes vomiting and diarrhea. (L6)

Adverse Effects:

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

>> Occupational hepatotoxin - Secondary hepatotoxins: the potential for toxic effect in the occupational setting is based on cases of poisoning by human ingestion or animal experimentation.

>> 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.

Toxicity Data:

>> LD50: 225 mg/kg (Oral, Rat) (L459) LD50: 14 mg/kg (Intraperitoneal, Mouse) (T14)

Minimum Risk Level:

The minimal risk level (MRL) is an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health

>> Acute Inhalation: 0.00003 mg/m3 (L134) Chronic Inhalation: 0.00001 mg/m3 (L134) Intermediate Oral: 0.0005 mg/kg/day (L134) Chronic Oral: 0.0001 mg/kg/day (L134)

Treatment:

Treatment when exposed to toxin

>> Cadmium poisoning is treated by removal from exposure and supportive care. If ingested, induced vomiting or gastric lavage may be performed. (L139)

Interactions:

>> Few studies have characterized the molecular and biochemical mechanisms involved in ovarian steroidogenesis disruption by heavy metals, such as lead and cadmium coexposure, on F1 generation offspring. In this study, adult pregnant female rats were treated subcutaneously (0.05 mg/kg of body weight per day) with sodium acetate (control), lead acetate, and cadmium acetate separately and in combination throughout gestational and lactational period, and all

animals from each of the experimental groups were sacrificed by decapitation on postnatal day 56 for various assays. The activities of key steroidogenic enzymes (17-hydroxysteroid dehydrogenase and 3-hydroxysteroid dehydrogenase) decreased in all the metal-treated groups. But the most significant decrease in the activities was observed in the cadmium-treated group, whereas the combined exposure group showed an intermediate effect. Serum estradiol and progesterone levels were also significantly altered in all the metal-treated groups, with the cadmium-exposed group showing maximum reductions as compared with the control group. The inhibitory effects of lead and cadmium on ovarian steroidogenic acute regulatory protein (StAR) mRNA levels along with CYP11 mRNA levels were also observed. Ovarian cholesterol content measured also showed significant depletion in all the metal-treated groups, with the cadmium-exposed group showing the maximum depletion. The activities of ovarian enzymatic antioxidants, such as superoxide dismutase, catalase, and glutathione peroxidase, were all significantly diminished along with significant depletion in nonenzymatic antioxidants. Lipid peroxidation was elevated significantly in all the metal-treated groups. In conclusion, lead and cadmium inhibit ovarian steroidogenesis by downregulating StAR gene expression along with inhibiting activities of steroidogenic enzymes and antioxidant system.

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 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. /Cadmium and Related Compounds/

Human Toxicity Excerpts:

>> /SIGNS AND SYMPTOMS/ INHALATION CAUSES COUGHING, SNEEZING, SYMPTOMS OF LUNG DAMAGE. INGESTION PRODUCES SEVERE TOXIC SYMPTOMS /OF NAUSEA, VOMITING & LOSS OF CONSCIOUSNESS/ BOTH KIDNEY & LIVER DAMAGE MAY OCCUR. CONTACT WITH EYES CAUSES IRRITATION.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ The effect of cadmium acetate (0.32, 1.0, 3.2 mg/kg) and (1, 3.2, 10 ug) injected intravenously (iv) and intracerebroventricularly (icv) respectively in urethane anesthetized male Sprague-Dawley (S-D) rats on blood pressure was examined. Cadmium injected (iv) produced transient fall in blood pressure followed by persistent rise. Hypertensive response in rats was dose and time dependent on intravenous cadmium administration. Cadmium (icv) produced statistically significant ($p<0.01$) hypertensive response at different time intervals as compared to saline treated controls. Repeated administration of cadmium (1 mg/kg ip for 5 days) produced increase in blood pressure. In four groups of rats treated with cadmium (1 mg/kg ip for 5 days), blood pressure was recorded 2,4,10,15 days after stopping the cadmium treatment. Blood pressure values at 2, 4, 10 days after stopping cadmium treatment were statistically significant ($p<0.01$). However, in the last group, blood pressure values were not statistically significant. These results show that cadmium exposure by (iv and icv) routes produced hypertensive response in rats. Hypertensive response is observed for the period of 2 weeks time in rats.

Non-Human Toxicity Values:

>> LD50 Mouse ip 14 mg/kg

12. Ecological Information

ICSC Environmental Data:

>> The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in plants and seafood. It is strongly advised not to let the chemical enter into the environment.

13. Disposal Considerations

Spillage Disposal

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

Disposal Methods

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number D006, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

>> Precipitate /cadmium/ from solutions /of cadmium acetate/ as sulfides, and return to supplier.

>> Peer-review: Soluble cadmium cmpd are converted to insoluble form, the sludge filtered, solidified and deposited in a suitable /SRP: hazardous waste/ landfill. Incineration of cadmium cmpd is not recommended because of the high sublimability of the oxide. (Peer-review conclusions of an IRPTC expert consultation (May 1985))

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number D006, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste. /Cadmium/

>> SRP: At the time of review, criteria for land treatment or burial (sanitary landfill) disposal practices are subject to significant revision. Prior to implementing land disposal of waste residue (including waste sludge), consult with environmental regulatory agencies for guidance on acceptable disposal practices.

14. Transport Information

DOT

Cadmium acetate
6.1
UN Pack Group: III
Reportable Quantity of 10 lb or 4

IATA

Cadmium acetate
6.1,
UN Pack Group: III

15. Regulatory Information

Federal Drinking Water Standards:

Federal drinking water standards (e.g. maximum containment level (MCL)) for this chemical. These standards are legally enforceable.

>> Maximum contaminant levels for inorganic contaminants: 0.005 mg/L /Cadmium/

Federal Drinking Water Guidelines:

Federal drinking water guidelines (e.g. maximum containment level (MCL)) for this chemical. In general, these guidelines are recommendations and not legally enforceable.

>> Maximum contaminant level goals for inorganic contaminants: 0.005 mg/L /Cadmium/

State Drinking Water Standards:

State drinking water standards (e.g. maximum containment level (MCL)) for this chemical. These standards are legally enforceable.

>> (AZ) ARIZONA 10 ug/L /Cadmium/

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.

>> Cadmium acetate 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

The Australian Inventory of Industrial Chemicals

>> Chemical: Acetic acid, cadmium salt

REACH Restricted Substance

>> Restricted substance: Cadmium di(acetate)

>> EC: 208-853-2

New Zealand EPA Inventory of Chemical Status

>> Cadmium acetate: 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.

>> Toxic cadmium oxide fumes may form in fires.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Water soluble cadmium(2+) salts: Environment tier II assessment

>> IMAP assessments - Soluble cadmium salts: Human health tier II assessment

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of the product's properties. Ionz is not responsible for any damages resulting from handling or contact with the product incorrectly."