ionz

SAFETY DATA SHEET

Updated on 25/09/2024

1. Material Identification

Product Name : Methyl hydrazine
Catalog Number : io-2667
CAS Number : 60-34-4
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

>> H225 (85.1%): Highly Flammable liquid and vapor [Danger Flammable liquids]

>> H300+H310+H330 (33%): Fatal if swallowed, in contact with skin or if inhaled [Danger Acute toxicity, oral; acute toxicity, dermal; acute toxicity, inhalation]

>> H300 (97.3%): Fatal if swallowed [Danger Acute toxicity, oral]

>> H310 (97.3%): Fatal in contact with skin [Danger Acute toxicity, dermal]

>> H314 (91.9%): Causes severe skin burns and eye damage [Danger Skin corrosion/irritation]

>> H317 (62%): May cause an allergic skin reaction [Warning Sensitization, Skin]

>> H318 (54.8%): Causes serious eye damage [Danger Serious eye damage/eye irritation]

>> H330 (98.2%): Fatal if inhaled [Danger Acute toxicity, inhalation]

>> H334 (22.2%): May cause allergy or asthma symptoms or breathing difficulties if inhaled [Danger Sensitization, respiratory]

>> H350 (98.6%): May cause cancer [Danger Carcinogenicity]

>> H400 (71%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (75.1%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

>> H411 (22.2%): Toxic to aquatic life with long lasting effects [Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P203, P210, P233, P240, P241, P242, P243, P260, P261, P262, P264, P264+P265, P270, P271, P272, P273, P280, P284, P301+P316, P301+P330+P331, P302+P352, P302+P361+P354, P303+P361+P353, P304+P340, P305+P354+P338, P316, P317, P318, P320, P321, P330, P333+P317, P342+P316, P361+P364, P362+P364, P363, P370+P378, P391, P403, P403+P233, P403+P235, P405, and P501

NFPA 704 Diamond

NFPA Health Rating

>> 4 - Materials that, under emergency conditions, can be lethal.

NFPA Fire Rating

>> 3 - Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions.

NFPA Instability Rating

>> 2 - Materials that readily undergo violent chemical changes at elevated temperatures and pressures.

NFPA Specific Notice

>> W - No water: Materials that react violently or explosively with water.

Highly Hazardous Substance:

This section provides information on this chemical as a highly hazardous substance (due to potential safety and hazards issues from its high toxicity and/or reactivity). The information in this section is from two sources: (1) Annex XVII to REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) from the European Chemicals Agency (ECHA), (2) ECHA's Candidate List of Substances of Very High Concern (SVHC) for Authorisation and (3) the List of Highly Hazardous Chemicals, Toxics and Reactives (29 CFR 1910.119 Appendix A).

OSHA Highly Hazardous Chemicals, Toxics and Reactives

>> Chemical: Methyl Hydrazine

>> Threshold: 100 [lb]

>> Note: Methyl Hydrazine in quantities at or above above 100lb presents a potential for a catastrophic event as a toxic or reactive highly hazardous chemical.

Health Hazards:

>> Methyl hydrazine vapors are extremely toxic and the liquid is corrosive to skin. Methyl hydrazine is the strongest convulsant and the most toxic of methyl-substituted hydrazine derivatives. It is more toxic than hydrazine. At high doses, it is a strong central nervous system poison that can lead to convulsions and death. Skin rash may be aggravated by skin exposure. (EPA, 1998)

ERG 2024, Guide 131 (Methylhydrazine)

>> TOXIC; may be fatal if inhaled, ingested or absorbed through skin.

>> Inhalation or contact with some of these materials will irritate or burn skin and eyes.

>> Methyl chloroacetate (UN2295) is an eye irritant/lachrymator (causes flow of tears).

>> Fire will produce irritating, corrosive and/or toxic gases.

>> Vapors may cause dizziness or asphyxiation, especially when in closed or confined areas.

>> Runoff from fire control or dilution water may cause environmental contamination.

>> Extremely flammable; ignites spontaneously under almost all normal temperature conditions. Water used to extinguish a fire may cause pollution and should be diked for later disposal. Water may be ineffective in extinguishing fires due to the chemical's low flash point. Because of the wide flammability limits, low flash point, and reignition hazard, dry chemicals, carbon dioxide, water spray, and foam may not be as effective as water dilution of fire area. The vapor is heavier than air; thus it may accumulate sufficiently to flash back. Methylhydrazine fires produce irritating nitrogen oxides. Ignites spontaneously in air when in contact with porous materials (e.g., earth, asbestos, wood, or cloth). Also ignites spontaneously on contact with strong oxidizing agents (e.g., fluorine, chlorine trifluoride, fuming nitric acid, and nitrogen tetroxide). Heat or flame should be avoided because chemical is extremely flammable and explosive. (EPA, 1998)

ERG 2024, Guide 131 (Methylhydrazine)

>> HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.

>> CAUTION: Methanol (UN1230) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

>> Vapors may form explosive mixtures with air.

>> Vapors may travel to source of ignition and flash back.

>> Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).

>> Vapor explosion and poison hazard indoors, outdoors or in sewers.

>> Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.

>> Runoff to sewer may create fire or explosion hazard.

>> Containers may explode when heated.

>> Many liquids will float on water.

>> Highly flammable. Many reactions may cause fire or explosion. Gives off irritating or toxic fumes (or gases) in a fire. Vapour/air mixtures are explosive. Risk of fire and explosion on contact with oxidizing agents or metal oxides.

Hazards Identification

ERG Hazard Classes

>> Toxic/poison by inhalation (TIH/PIH)

3. Composition/Information On Ingredients

Chemical name : Methyl hydrazine
CAS Number : 60-34-4
Molecular Formula : CH6N2
Molecular Weight : 46.0720 g/mol

4. First Aid Measures

First Aid:

>> Warning: Symptoms may be delayed from hours to days. Caution is advised.

>> Signs and Symptoms of Acute Methyl Hydrazine Exposure: Symptoms of acute exposure to methyl hydrazine may include facial numbness, facial swelling, and increased salivation. Headache, twitching, seizure, convulsions, and coma may also occur. Gastrointestinal signs and symptoms include anorexia, nausea, and vomiting. Pulmonary edema and hypotension (low blood pressure) are common. Methyl hydrazine is toxic to the liver, ruptures red blood cells, and may cause kidney damage. Contact with the skin, eyes, or mucous membranes may result in severe irritation and permanent damage.

>> Emergency Life-Support Procedures: Acute exposure to methyl hydrazine 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 methyl hydrazine.

>> 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 methyl hydrazine.

>> 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 THOROUGHLY 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. 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.

>> 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)

ERG 2024, Guide 131 (Methylhydrazine)

>> 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.

>> Specific First Aid:

>> Wash skin with soap and water.

>> In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.

>> 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. Artificial respiration may be needed. Refer for medical attention.

Skin First Aid

>> First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again. 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. Do NOT induce vomiting. Give one or two glasses of water to drink. Refer for medical attention .

5. Fire Fighting Measures

>> Vapors are heavier than air and may travel to a source of ignition and flash back.

>> Wear positive pressure breathing apparatus and special (full) protective clothing. No skin surface should be exposed. Isolate area for 1/2-mile in all directions if a tank car or truck is involved in a fire.

>> For small fires, use dry chemical, carbon dioxide, water spray, and foam. For large fires, use water spray, fog, or foam. Keep unnecessary people away and isolate the hazardous area. Stay upwind and keep out of low-lying areas.

>> Fire exposed containers should be kept cool with water. Use water spray to disperse vapors and protect men attempting to stop a leak which has not ignited. Move container from fire area if it can be done without risk. (EPA, 1998)

>> Use water in large amounts, powder, alcohol-resistant foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water. Combat fire from a sheltered position.

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 131 [Flammable Liquids - Toxic]:

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

>> SPILL: See ERG Table 1 - Initial Isolation and Protective Action Distances on the UN/NA 1244 datasheet.

>> 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 131 (Methylhydrazine)

>> Immediate precautionary measure

>> Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

>> 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.

Isolation

>> Small spill:

>> ISOLATE in all directions: 30 m (100 ft)

>> Large spill:

>> ISOLATE in all directions: 150 m (500 ft)

Protection

>> Small spill:

>> PROTECT people from downwind during DAY time: 0.3 km (0.2 mi)

>> PROTECT people from downwind during NIGHT time: 0.6 km (0.4 mi)

>> Large spill:

>> PROTECT people from downwind during DAY time: 1.5 km (0.9 mi)

>> PROTECT people from downwind during NIGHT time: 2.2 km (1.4 mi)

Spillage Disposal:

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

>> Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment.

Accidental Release Measures

Public Safety: ERG 2024, Guide 131 (Methylhydrazine)

>> 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.

>> Keep unauthorized personnel away.

>> Stay upwind, uphill and/or upstream.

>> Ventilate closed spaces before entering, but only if properly trained and equipped.

Spill or Leak: ERG 2024, Guide 131 (Methylhydrazine)

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

>> All equipment used when handling the product must be grounded.

>> Do not touch or walk through spilled material.

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

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

>> A vapor-suppressing foam may be used to reduce vapors.

>> Small Spill

>> Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

>> Use clean, non-sparking tools to collect absorbed material.

>> Large Spill

>> Dike far ahead of liquid spill for later disposal.

>> Water spray may reduce vapor, but may not prevent ignition in closed spaces.

7. Handling And Storage

Safe Storage:

>> Fireproof. Separated from strong oxidants, strong acids, metal oxides, porous materials and food and feedstuffs. Dry. Well closed. Keep under inert gas.

Storage Conditions:

>> Store in a cool, dry, well-ventilated location. Separate from acids, oxidizing materials, halogens, & air. Outside or detached storage is preferred.

8. Exposure Control/ Personal Protection

REL-C (Ceiling)

>> 0.04 ppm (0.08 mg/m³), [120 minutes]

>> Ca C 0.04 ppm (0.08 mg/m3) [2-hr] See Appendix A

PEL-C (Ceiling)

>> 0.2 ppm (0.35 mg/m³)

>> C 0.2 ppm (0.35 mg/m3) [skin]

>> 0.01 [ppm]

>> 0.01 ppm as TWA; (skin); A3 (confirmed animal carcinogen with unknown relevance to humans).

TLV-TWA (Time Weighted Average)

>> 0.01 ppm [1991]

MAK (Maximale Arbeitsplatz Konzentration)

>> skin absorption (H); sensitization of skin (SH); carcinogen category: 2; germ cell mutagen group: 3B

Emergency Response: ERG 2024, Guide 131 (Methylhydrazine)

>> CAUTION: The majority of these products have a very low flash point. Use of water spray when fighting fire may be inefficient.

>> CAUTION: Methanol (UN1230) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

>> Small Fire

>> Dry chemical, CO2, water spray or alcohol-resistant foam.

>> Large Fire

>> Water spray, fog or alcohol-resistant foam.

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

>> Dike runoff from fire control for later disposal.

>> Avoid aiming straight or solid streams directly onto the product.

>> Fire Involving Tanks, Rail Tank Cars or Highway Tanks

>> Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.

>> 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.

>> For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Inhalation Risk:

>> A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20 °C.

Effects of Short Term Exposure:

>> The substance is corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion. The substance may cause effects on the central nervous system, liver and blood. This may result in liver impairment and the formation of methaemoglobin. Exposure far above the OEL could cause death. The effects may be delayed. Medical observation is indicated.

Effects of Long Term Exposure:

>> The substance may have effects on the liver and blood. This may result in liver impairment and the formation of methaemoglobin. This substance is possibly carcinogenic to humans.

Fire Prevention

>> NO open flames, NO sparks and NO smoking. NO contact with strong oxidizing agents. NO contact with hot surfaces. Closed system, ventilation, explosion-proof electrical equipment and lighting.

Exposure Prevention

>> AVOID ALL CONTACT! IN ALL CASES CONSULT A DOCTOR!

Inhalation Prevention

>> Use ventilation, 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

Protective Clothing: ERG 2024, Guide 131 (Methylhydrazine)

>> 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.

Exposure Summary

>> 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:

>> 46.072

Exact Mass:

>> 46.053098200

Physical Description:

>> Methylhydrazine appears as a colorless liquid with an ammonia-like odor. Flash point below 75 °F. Spontaneous ignition may occur in contact with oxidizing materials. Very toxic by inhalation and by skin absorption. Produces toxic oxides of nitrogen during combustion. Rate of onset: Immediate Persistence: Hours - days Odor threshold: 1-10 ppm Source/use/other hazard: Solvent, rocket fuel; flammable; irritating to skin/eyes.

>> COLOURLESS HYGROSCOPIC LIQUID WITH CHARACTERISTIC ODOUR.

Color/Form:

>> Clear liquid

Odor:

>> Odor characteristic of short chain, organic amines

Boiling Point:

>> 190 °F at 760 mmHg (EPA, 1998)

>> 87.5 °C

Melting Point:

>> -62.3 °F (EPA, 1998)

>> -52.4 °C

Flash Point:

>> 158 °F (EPA, 1998)

>> -8.3 °C c.c.

Solubility:

>> Insoluble (<1 mg/ml at 75 °F) (NTP, 1992)

>> Solubility in water: miscible

Density:

>> 0.874 at 77 °F (EPA, 1998) - Less dense than water; will float

>> Relative density (water = 1): 0.87

Vapor Density:

>> 1.6 (EPA, 1998) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 1.6

Vapor Pressure:

>> 49.6 mmHg at 77 °F (EPA, 1998)

>> Vapor pressure, kPa at 20 °C: 4.8

LogP:

>> log Kow= -1.05

>> -1.05

Autoignition Temperature:

>> 382 °F (USCG, 1999)

>> 196 °C

Decomposition:

>> When heated to decomposition it emits toxic fumes of /nitrogen oxide/.

Viscosity:

>> 0.775 cP at 25 °C

Heat of Combustion:

>> -1304.2 kJ/mol

Heat of Vaporization:

>> 37.212 kJ/mol

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.

>> Mildly alkaline base

Surface Tension:

>> 33.83 dynes/cm

Ionization Potential:

>> 8.00 eV

Odor Threshold:

>> Odor Threshold Low: 1.7 [mmHg]

>> [NRC 1985] Odor threshold from CHEMINFO

Refractive Index:

>> Index of refraction: 1.4325 @ 20 °C/d

Dissociation Constants:

>> pKa = 7.87 (conjugate acid)

10. Stability And Reactivity

>> Highly flammable. Often ignites spontaneously. Exposure to air on a large surface may result in spontaneous ignition [Def. Res. and Eng. 27. 1963]. Water soluble. Solutions are highly alkaline and generate heat when water is added.

>> Strong Reducing Agent

>> Pyrophoric

11. Toxicological Information

EPA Provisional Peer-Reviewed Toxicity Values:

This section provides the EPA Provisional Peer-Reviewed Toxicity Values (PPRTVs) and links of related assessment documents.

Chemical Substance

>> Methyl Hydrazine

Reference Dose (RfD), Chronic

>> 1 x 10^-3 mg/kg-day

Reference Dose (RfD), Subchronic

>> 1 x 10^-3 mg/kg-day

PPRTV Assessment

>> PDF Document

Weight-Of-Evidence (WOE)

>> Likely to be carcinogenic to humans

Last Revision

>> 2010

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).

>> A3; Confirmed animal carcinogen with unknown relevance to humans.

Exposure Routes:

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

>> inhalation, skin absorption, ingestion, skin and/or eye contact

Inhalation Exposure

>> Burning sensation. Cough. Nausea. Vomiting. Blue lips, fingernails and skin. Dizziness. Headache. Shortness of breath. Laboured breathing. Convulsions. Symptoms may be delayed.

Skin Exposure

>> MAY BE ABSORBED! Redness. Skin burns. Pain. Further see Inhalation.

Eye Exposure

>> Redness. Pain. Severe deep burns.

Ingestion Exposure

>> Abdominal cramps. Burning sensation. Shock or collapse. Further see Inhalation.

>> irritation eyes, skin, respiratory system; vomiting, diarrhea, tremor, ataxia; anoxia, cyanosis; convulsions; [potential occupational carcinogen]

Target Organs:

Organs that are affected by exposure to this chemical. Information in this section reflects human data unless otherwise noted.

>> Eyes, skin, respiratory system, central nervous system, liver, blood, cardiovascular system

Cancer Sites:

The site in which cancer develops due to exposure to this compound. Cancers are casually referred to based on their primary sites (e.g., skin, lung, breasts, prostate, colon and rectum).

>> [in animals: lung, liver, blood vessel & intestine tumors]

Adverse Effects:

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

>> Neurotoxin - Other CNS neurotoxin

>> 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.

>> Methemoglobinemia - The presence of increased methemoglobin in the blood; the compound is classified as secondary toxic effect

>> 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.

>> Dermatotoxin - Skin burns.

>> Toxic Pneumonitis - Inflammation of the lungs induced by inhalation of metal fumes or toxic gases and vapors.

>> ACGIH Carcinogen - Confirmed Animal.

Toxicity Data:

>> LC50 (rat) = 34 ppm/4 hr

Interactions:

>> Administration of methylhydrazine to mice decreases survival of animals after x-irradiation, inhibited growth of Ehrlich ascites tumor, and increased number of cells with chromosome aberrations.

Antidote and Emergency Treatment:

>> Specific treatment for exposure consists of thorough washing of all exposed skin areas with soap and water, copious irrigation of the eyes, and prompt removal of the patient from the source of exposure. /Hydrazines/

Human Toxicity Excerpts:

>> /HUMAN EXPOSURE STUDIES/ Human subjects exposed to methylhydrazine (MH) at 90 ppm for 10 min and recorded the subjective irritancy and measurements of clinical chemistry and hematology. The subjects were given pretest physicals, which included nasal and neurological examinations, and were monitored for 60 d post-exposure. ... No changes were seen in any of 14 clinical chemistry tests despite subjective reports of a moderate to strong odor and slight moistening of the eyes and tickling of the nose. No mention was made of any nasal lesions resulting from the MH exposure. Heinz bodies appeared in 3% to 5% of red blood cells (RBCs) by the seventh-day post-exposure, began to decrease after 2 w, and were not detectable 60 d post-exposure. Heinz bodies were not accompanied by any signs of anemia or reticulocytosis.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ The main targets of methylhydrazine (MH) toxicity are the blood (hemolytic anemia with decreased hemoglobin, red cell count, and hematocrit; reticulocytosis; methemoglobinemia; and Heinz body formation) and central nervous system (hyperactivity, tremors, and severe clonic-tonic convulsions), with kidney toxicity possibly associated with hemolytic anemia.

Non-Human Toxicity Values:

>> LC50 Rat inhalation 74-78 ppm/4 hr (calculated)

Populations at Special Risk:

>> ...Special consideration /is needed/ for MMH workers with preexisting blood dyscrasias or hemolytic traits.

12. Ecological Information

Resident Soil (mg/kg)

>> 1.40e-01

Industrial Soil (mg/kg)

>> 6.20e-01

Resident Air (ug/m3)

>> 2.80e-03

Industrial Air (ug/m3)

>> 1.20e-02

Tapwater (ug/L)

>> 5.60e-03

MCL (ug/L)

>> 4.00e+01

Risk-based SSL (mg/kg)

>> 1.3e-06

Inhalation Unit Risk (ug/m3)-1

>> 1.00e-03

Chronic Oral Reference Dose (mg/kg-day)

>> 1.00e-03

Chronic Inhalation Reference Concentration (mg/m3)

>> 2e-05

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

Soil Saturation Concentration (mg/kg)

>> 1.80e+05

ICSC Environmental Data:

>> The substance is toxic to aquatic organisms.

13. Disposal Considerations

Spillage Disposal

>> Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment.

Disposal Methods

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number P068, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

>> Methyl hydrazine is a good candidate for liquid injection incineration with a temperature range of 650 to 1600 °C and a residence time of 0.1 to 2 seconds. Also a good candidate for rotary kiln incineration with a temperature range of 820 to 1,600 °C and residence times of seconds for liquids and gases; for solids hours. Also a good candidate fluidized bed incineration with a temperature range of 450 to 980 °C and residence times of seconds for liquids and gases; longer for solids.

>> Small Quantities. Wear butyl rubber gloves, laboratory coat and eye prolection. Work in the fume hood. Prepare a dilute (5%) aqueous solution of methylhydrazine by adding slowly to the appropriate volume of water. For each 1 g of methylhydrazine, place 41 ml (about 25% excess) of household laundry bleach (5.25% sodium hypochlorite) into a 3-necked round-bottom flask equipped with a stirrer, thermometer and dropping funnel. Add the aqueous methylhydrazine dropwise to the stirred hypochlorite solution, monitoring the rate of addition by rise in temperature. The temperature is maintained at 45-50 °C and addition takes about 1 hour. Stirring is continued for 2 hours until the temperature gradually falls to room temperature.

>> Incomplete reaction of hypochlorite with the methylated hydrazine fuels monomethylhydrazine and unsymmetrical dimethylhydrazine leads to a wide variety of byproducts, including N-nitrosoamines, which are believed to be highly carcinogenic.

14. Transport Information

DOT

Methyl hydrazine
6.1
UN Pack Group: I
Reportable Quantity of 10 lb or 4

IATA

Methyl hydrazine
6.1, 3 and 8

UN Pack Group: I

15. Regulatory Information

DHS Chemicals of Interest (COI):

This section provides the Department of Homeland Security (DHS) Chemicals of Interest (COI) and related information (Ref: 6 eCFR part 27 - https://www.ecfr.gov/current/title-6/chapter-I/part-27).

Chemicals of Interest(COI)

>> Methyl hydrazine

Release: Minimum Concentration (%)

>> 1

Release: Screening Threshold Quantities (in pounds)

>> 15000

Security Issue: Release - Toxic

>> Toxic chemical that can be released at a facility.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Hydrazine, methyl-

REACH Registered Substance

>> Status: Active Update: 16-02-2018 https://echa.europa.eu/registration-dossier/-/registered-dossier/13414

>> Status: Cease Manufacture Update: 15-11-2012 https://echa.europa.eu/registration-dossier/-/registered-dossier/1502

>> Status: Active Update: 11-01-2017 https://echa.europa.eu/registration-dossier/-/registered-dossier/18686

>> Status: Active Update: 22-03-2011 https://echa.europa.eu/registration-dossier/-/registered-dossier/6669

16. Other Information

Toxic Combustion Products:

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

>> Toxic oxides of nitrogen are produced during combustion of this material.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Hydrazine, methyl-: 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."