ionz

SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Hydrazine
Catalog Number : io-2496
CAS Number : 302-01-2
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

>> H226 (> 99.9%): Flammable liquid and vapor [Warning Flammable liquids]

>> H301 (100%): Toxic if swallowed [Danger Acute toxicity, oral]

>> H310 (15%): Fatal in contact with skin [Danger Acute toxicity, dermal]

>> H311 (85%): Toxic in contact with skin [Danger Acute toxicity, dermal]

>> H314 (100%): Causes severe skin burns and eye damage [Danger Skin corrosion/irritation]

>> H317 (100%): May cause an allergic skin reaction [Warning Sensitization, Skin]

>> H318 (55.4%): Causes serious eye damage [Danger Serious eye damage/eye irritation]

>> H330 (66.8%): Fatal if inhaled [Danger Acute toxicity, inhalation]

>> H331 (33.2%): Toxic if inhaled [Danger Acute toxicity, inhalation]

>> H350 (100%): May cause cancer [Danger Carcinogenicity]

>> H400 (> 99.9%): 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

>> 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, P361+P364, P362+P364, P363, P370+P378, P391, 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

>> 4 - Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily.

NFPA Instability Rating

>> 3 - Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction but that require a strong initiating source or must be heated under confinement before initiation.

Health Hazards:

>> Target organs affected include central nervous system; respiratory system; skin and eyes. Chronic exposure in humans may cause pneumonia, liver and kidney damage. Liver damage may be more severe than kidney damage. It is a suspected human carcinogen. (EPA, 1998)

ERG 2024, Guide 153 (Hydrazine, aqueous solution, with more than 37% hydrazine; Hydrazine, aqueous solution, with not more than 37% hydrazine)

>> TOXIC and/or CORROSIVE; inhalation, ingestion or skin contact with material may cause severe injury or death.

>> Methyl bromoacetate (UN2643) is an eye irritant/lachrymator (causes flow of tears).

>> Contact with molten substance may cause severe burns to skin and eyes.

>> Avoid any skin contact.

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

>> Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

ERG 2024, Guide 132 (Hydrazine, anhydrous)

>> May cause toxic effects if inhaled or ingested.

>> Contact with substance may cause severe burns to skin and eyes.

>> 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.

ERG 2024, Guide 132 (Hydrazine aqueous solution, flammable, with more than 37% hydrazine)

>> May cause toxic effects if inhaled or ingested.

>> Contact with substance may cause severe burns to skin and eyes.

>> 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.

>> It is a flammable/combustible material and may be ignited by heat, sparks, or flames. Vapor may travel to a source of ignition and flash back. Container may explode in heat of fire. Vapor explosion and poison hazard indoors, outdoors, or in sewers. Runoff to sewer may create fire or explosion hazard. Vapors form explosive mixtures with air. May continue to burn in the absence of air. Decomposition gives off toxic nitrogen compound fumes. Can catch fire when in contact with porous materials such as wood, asbestos, cloth, earth, and rusty metals. Incompatible with oxidizers, hydrogen peroxide, nitric acid, metal oxides, and strong acids. Hazardous polymerization may not occur. (EPA, 1998)

ERG 2024, Guide 153 (Hydrazine, aqueous solution, with more than 37% hydrazine; Hydrazine, aqueous solution, with not more than 37% hydrazine)

>> Combustible material: may burn but does not ignite readily.

>> When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.

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

>> Corrosives in contact with metals may evolve flammable hydrogen gas.

>> Containers may explode when heated.

>> Runoff may pollute waterways.

>> Substance may be transported in a molten form.

ERG 2024, Guide 132 (Hydrazine, anhydrous)

>> Flammable/combustible material.

>> May be ignited by heat, sparks or flames.

>> 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 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.

ERG 2024, Guide 132 (Hydrazine aqueous solution, flammable, with more than 37% hydrazine)

>> Flammable/combustible material.

>> May be ignited by heat, sparks or flames.

>> 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 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.

>> Flammable. Above 40 °C explosive vapour/air mixtures may be formed. Risk of fire and explosion on contact with many materials.

3. Composition/Information On Ingredients

Chemical name : Hydrazine
CAS Number : 302-01-2
Molecular Formula : H4N2
Molecular Weight : 32.0460 g/mol

4. First Aid Measures

First Aid:

>> Warning: Effects may be delayed for hours to days. Caution is advised.

>> Signs and Symptoms of Acute Hydrazine Exposure: Signs and symptoms of acute exposure to hydrazine may include severe eye irritation, facial numbness, facial swelling, and increased salivation. Hydrazine vapor may immediately irritate the nose and throat. Headache, twitching, seizures, convulsions, and coma may also occur. Gastrointestinal signs and symptoms include anorexia, nausea, and vomiting. Pulmonary edema and hypotension (low blood pressure) are common. Hydrazine is toxic to the liver, ruptures red blood cells, and may cause kidney damage. Dermal contact may result in irritation or severe burns.

>> Emergency Life-Support Procedures: Acute exposure to 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 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. Transport to a health care facility.

>> Dermal/Eye Exposure:

>> 1. Remove victims from exposure. Emergency personnel should avoid self- exposure to 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. 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. 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. Transport to a health care facility. (EPA, 1998)

ERG 2024, Guide 153 (Hydrazine, aqueous solution, with more than 37% hydrazine; Hydrazine, aqueous solution, with not more than 37% hydrazine)

>> 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:

>> For corrosives, in case of contact, immediately flush skin or eyes with running water for at least 30 minutes. Additional flushing may be required.

>> Removal of solidified molten material from skin requires medical assistance.

>> In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the "ERAP" section.

ERG 2024, Guide 132 (Hydrazine, anhydrous)

>> 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:

>> For corrosives, in case of contact, immediately flush skin or eyes with running water for at least 30 minutes. Additional flushing may be required.

>> 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.

ERG 2024, Guide 132 (Hydrazine aqueous solution, flammable, with more than 37% hydrazine)

>> 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:

>> For corrosives, in case of contact, immediately flush skin or eyes with running water for at least 30 minutes. Additional flushing may be required.

>> 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. Half-upright position. Refer immediately 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 immediately for medical attention.

Eye First Aid

>> Rinse with plenty of water (remove contact lenses if easily possible). Refer immediately for medical attention.

Ingestion First Aid

>> Rinse mouth. Give nothing to drink. Do NOT induce vomiting. Refer immediately for medical attention.

5. Fire Fighting Measures

>> Vapors are heavier than air and will collect in low areas. Vapors may travel long distances to ignition sources and flashback. Vapors in confined areas may explode when exposed to fire. Containers may explode in fire. Storage containers and parts of containers may rocket great distances, in many directions.

>> Stay upwind; keep out of low areas. Wear positive pressure breathing apparatus and protective clothing. Isolate for one-half mile in all directions if tank car or truck is involved in fire. Move container from fire area if you can do so without risk. Dike fire control water for later disposal; do not scatter material. Spray cooling water on containers that are exposed to flames until well after fire is out.

>> Small fires: dry chemical, carbon dioxide, water spray or foam. Large fires: water spray, fog, or foam. (EPA, 1998)

>> Excerpt from ERG Guide 132 [Flammable Liquids - Corrosive]:

>> Some of these materials may react violently with water.

>> 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. Do not get water inside containers.

>> 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. (ERG, 2024)

>> Excerpt from ERG Guide 153 [Substances - Toxic and/or Corrosive (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)

>> Use alcohol-resistant foam, foam, water spray, dry powder, 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 132 [Flammable Liquids - Corrosive]:

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

>> 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)

Evacuation: ERG 2024, Guide 153 (Hydrazine, aqueous solution, with more than 37% hydrazine; Hydrazine, aqueous solution, with not more than 37% hydrazine)

>> 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

>> 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.

Evacuation: ERG 2024, Guide 132 (Hydrazine, anhydrous)

>> 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.

Evacuation: ERG 2024, Guide 132 (Hydrazine aqueous solution, flammable, with more than 37% hydrazine)

>> 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.

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. Collect leaking liquid in sealable non-metallic containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT absorb in saw-dust or other combustible absorbents.

Accidental Release Measures

Public Safety: ERG 2024, Guide 153 (Hydrazine, aqueous solution, with more than 37% hydrazine; Hydrazine, aqueous solution, with not more than 37% hydrazine)

>> 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 153 (Hydrazine, aqueous solution, with more than 37% hydrazine; Hydrazine, aqueous solution, with not more than 37% hydrazine)

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

>> Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

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

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

>> Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

>> DO NOT GET WATER INSIDE CONTAINERS.

Public Safety: ERG 2024, Guide 153 (Hydrazine, aqueous solution, with more than 37% hydrazine; Hydrazine, aqueous solution, with not more than 37% hydrazine)

>> 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 153 (Hydrazine, aqueous solution, with more than 37% hydrazine; Hydrazine, aqueous solution, with not more than 37% hydrazine)

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

>> Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

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

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

>> Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

>> DO NOT GET WATER INSIDE CONTAINERS.

Public Safety: ERG 2024, Guide 132 (Hydrazine, anhydrous)

>> 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 132 (Hydrazine, anhydrous)

>> 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.

>> Absorb with earth, sand or other non-combustible material.

>> For hydrazine, absorb with DRY sand or inert absorbent (vermiculite or absorbent pads).

>> 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.

Public Safety: ERG 2024, Guide 132 (Hydrazine aqueous solution, flammable, with more than 37% hydrazine)

>> 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 132 (Hydrazine aqueous solution, flammable, with more than 37% hydrazine)

>> 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.

>> Absorb with earth, sand or other non-combustible material.

>> For hydrazine, absorb with DRY sand or inert absorbent (vermiculite or absorbent pads).

>> 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 acids, metals, oxidants and food and feedstuffs. Keep under inert gas. Provision to contain effluent from fire extinguishing. Store in an area without drain or sewer access.

Storage Conditions:

>> Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

8. Exposure Control/ Personal Protection

REL-C (Ceiling)

>> 0.03 ppm (0.04 mg/m³) [120 minutes]

>> Ca C 0.03 ppm (0.04 mg/m3) [2-hour] See Appendix A

>> 1.0 [ppm]

PEL-TWA (8-Hour Time Weighted Average)

>> 1 ppm (1.3 mg/m³)

>> 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 [1988]

EU-OEL

>> 0.013 mg/m

MAK (Maximale Arbeitsplatz Konzentration)

>> skin absorption (H); sensitization of skin (SH); carcinogen category: 2

Emergency Response: ERG 2024, Guide 153 (Hydrazine, aqueous solution, with more than 37% hydrazine; Hydrazine, aqueous solution, with not more than 37% hydrazine)

>> 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.

Emergency Response: ERG 2024, Guide 132 (Hydrazine, anhydrous)

>> Some of these materials may react violently with water.

>> 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.

>> Do not get water inside containers.

>> 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.

Emergency Response: ERG 2024, Guide 132 (Hydrazine aqueous solution, flammable, with more than 37% hydrazine)

>> Some of these materials may react violently with water.

>> 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.

>> Do not get water inside containers.

>> 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.

>> ERPG-1: 0.5 ppm - one hour exposure limit: 1 = mild transient health effects or objectionable odor [AIHA]

>> ERPG-2: 5 ppm - one hour exposure limit: 2 = impaired ability to take protective action [AIHA]

>> ERPG-3: 30 ppm - one hour exposure limit: 3 = life threatening health effects [AIHA]

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. Inhalation may cause lung oedema, but only after initial corrosive effects on eyes and/or airways have become manifest. Corrosive on ingestion. The substance may cause effects on the liver and central nervous system. Exposure could cause death.

Effects of Long Term Exposure:

>> Repeated or prolonged contact may cause skin sensitization. The substance may have effects on the liver, kidneys and central nervous system. This substance is possibly carcinogenic to humans.

Fire Prevention

>> NO open flames, NO sparks and NO smoking. Above 40 °C use a closed system, ventilation and explosion-proof electrical equipment.

Exposure Prevention

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

Inhalation Prevention

>> Use closed system and ventilation.

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 153 (Hydrazine, aqueous solution, with more than 37% hydrazine; Hydrazine, aqueous solution, with not more than 37% hydrazine)

>> 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.

Protective Clothing: ERG 2024, Guide 153 (Hydrazine, aqueous solution, with more than 37% hydrazine; Hydrazine, aqueous solution, with not more than 37% hydrazine)

>> 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.

Protective Clothing: ERG 2024, Guide 132 (Hydrazine, anhydrous)

>> 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.

Protective Clothing: ERG 2024, Guide 132 (Hydrazine aqueous solution, flammable, with more than 37% hydrazine)

>> 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.

9. Physical And Chemical Properties

Molecular Weight:

>> 32.046

Exact Mass:

>> 32.037448136

Physical Description:

>> Hydrazine, anhydrous appears as a colorless, fuming oily liquid with an ammonia-like odor. Flash point 99 °F. Explodes during distillation if traces of air are present. Toxic by inhalation and by skin absorption. Corrosive to tissue. Produces toxic oxides of nitrogen during combustion. Used as a rocket propellant and in fuel cells.

>> COLOURLESS FUMING OILY HYGROSCOPIC LIQUID WITH PUNGENT ODOUR.

Color/Form:

>> Colorless oily liquid

Odor:

>> Penetrating odor resembling ammonia.

Boiling Point:

>> 236.3 °F at 760 mmHg (EPA, 1998)

>> 114 °C

Melting Point:

>> 36 °F (EPA, 1998)

>> 2 °C

Flash Point:

>> 125.6 °F (EPA, 1998)

>> 40 °C c.c.

Solubility:

>> Miscible (NIOSH, 2024)

>> Solubility in water: miscible

Density:

>> 1.011 at 59 °F (EPA, 1998) - Denser than water; will sink

>> Relative density (water = 1): 1.01

Vapor Density:

>> Relative vapor density (air = 1): 1.1

Vapor Pressure:

>> 14.4 mmHg at 77 °F (EPA, 1998)

>> Vapor pressure, kPa at 20 °C: 2.1

LogP:

>> log Kow = -2.07

>> -2.1

Stability/Shelf Life:

>> Stable under recommended storage conditions.

Autoignition Temperature:

>> 518 °F (USCG, 1999)

>> 270 °C

Decomposition:

>> Hazardous decomposition products formed under fire conditions - Nitrogen oxides (NOx).

Viscosity:

>> 0.974 uPa-sec at 20 °C

>> 0.0009 mm^2/s at 20 °C

Heat of Combustion:

>> -8345 btu/Lb = -4636 cal/g = -194.1X10+5 J/kg

Heat of Vaporization:

>> 44.7 kJ/mol at 25 °C

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.

>> Aqueous solutions of hydrazine are highly alkaline. pH of a 64 wt% aqueous solution of hydrazine is 12.75.

Surface Tension:

>> 66.7 mN/m at 25 °C

Ionization Potential:

>> 8.93 eV

Odor Threshold:

>> Odor Threshold Low: 3.0 [mmHg]

>> Odor Threshold High: 4.0 [mmHg]

>> AIHA detection odor threshold AIHA (mean = 3.7 ppm)

Refractive Index:

>> Surface tension 74.3 mN/m at 25 °C: Viscosity: 1.5 mPa.s at 25 °C: Index of refraction: 1.4644 at 25 °C/D; Heat of formation -242.71 kJ/mol /Hydrazine hydrate/

Dissociation Constants:

>> pKa = 7.96

10. Stability And Reactivity

>> Fumes in air. Highly flammable. Can self-ignite at low temperatures if in contact with a catalyst (example: autoignition temperature is 74 °F in contact with rust). May ignite spontaneously while absorbed on porous materials such as earth, asbestos, cloth, or wood unless the heat of the continual hydrazine-air reaction has a chance to dissipate [Haz. Chem. Data(1966)]. Water soluble.

>> Highly Flammable

>> Strong Reducing Agent

>> Air-Reactive

11. Toxicological Information

Toxicity Summary:

>> IDENTIFICATION AND USE: Hydrazine is a colorless oily liquid. It is used as an oxygen scavenger in boiler water treatment, as an electrodeless nickel coating reagent, and in rocket propellant. It is also used in a variety of other fields including pharmaceuticals, explosives, polymers and polymer additives, antioxidants, metal reductants, hydrogenation of organic groups, photography, xerography, and dyes. It has been tested as an experimental therapy. HUMAN STUDIES: Skin contact with anhydrous hydrazine leads to caustic-like burns and dissolves hair. Allergic contact dermatitis has been reported. Exposure to the eyes can produce temporary blindness. Liquid splashes to the eyes can produce corneal injury and burns. In cases of acute human poisoning, vomiting, severe irritation of the respiratory tract with the development of pulmonary edema, central nervous system depression, and hepatic and renal damage have been reported. Allergic contact dermatitis has been reported. Exposure to hydrazine increases the risk of incident lung cancers and colon cancers, based on a study in a cohort of aerospace workers. ANIMAL STUDIES: Hydrazine hydrate produced moderately severe irritation when 3 to 5 mL was applied to rabbit cornea, whereas 1 mL was much less irritating. Rabbit skin that was treated with 3 mL of anhydrous hydrazine for 1 min, followed by washing the treated area. Despite washing, mortality ensued 60 to 90 min after application. Acute toxicity has been characterized by liver damage consisting of fatty degeneration, red blood cell destruction and anemia, anorexia, weight loss, weakness, vomiting, excitability, hypoglycemia, and convulsions. Groups of dogs, monkeys, rats, and mice were exposed either 24 hr/day, 7 days/wk to 6.2 or 1 ppm, or 6 hr/day, 5 days/wk to 1 or 5 ppm hydrazine for 6 months. Mortality was seen in mice and dogs, but not in monkeys or rats. Dogs showed hematologic deficits and increased numbers of reticulocytes. Liver changes that consisted of moderate to severe fatty infiltration were marked in mice and dogs, were slight to moderate in monkeys, and were absent in the rat. Groups of rats were exposed orally during gestation to 8 mg/kg bw hydrazine. Maternal toxicity, including mortality and body weight loss, was seen, along with fetal toxicity that included reduced fetal weight and viability. Although some fetuses were pale and edematous, no major congenital malformations occurred. An increase in the number of lung tumors was observed in several strains of mice, but hydrazine did not increase the tumor yield in rats following either sc injection or intratracheal application. Hydrazine is positive in most standard assays for genetic toxicity endpoints. ECOTOXICITY STUDIES: Eggs of fathead minnows (Pimephales promelas) at the mid-cleavage stage were exposed to hydrazine for 24 or 48 hr. Embryos, exposed for 24 hr, to 0.1 mg/L, showed several defects, such as slightly or moderately subnormal heart beat, hemoglobin levels, body movement, and amount of eye pigment. Embryos exposed to a hydrazine concentration of 1.0 mg/L for 48 hr appeared to have little chance of survival. Surviving embryos showed severe deformities and larvae exhibited reduced growth.

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

>> Hydrazine

Reference Concentration (RfC), Chronic

>> 3 x 10^-5 mg/m^3

Reference Concentration (RfC), Subchronic

>> 9 x 10^-5 mg/m^3

PPRTV Assessment

>> PDF Document

Weight-Of-Evidence (WOE)

>> See the IRIS entry for Hydrazine

Last Revision

>> 2009

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 limited evidence in humans for the carcinogenicity of hydrazine. A positive association has been observed between exposure to hydrazine and cancer of the lung. There is sufficient evidence in experimental animals for the carcinogenicity of hydrazine. Hydrazine is probably carcinogenic to humans (Group 2A).

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).

IARC Carcinogenic Agent

>> Hydrazine

IARC Carcinogenic Classes

>> Group 2A: Probably carcinogenic to humans

IARC Monographs

>> Volume 4: (1974) Some Aromatic Amines, Hydrazine and Related Substances, N-Nitroso Compounds and Miscellaneous Alkylating Agents

>> Volume Sup 7: Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1 to 42, 1987; 440 pages; ISBN 92-832-1411-0 (out of print)

>> Volume 71: (1999) Re-evaluation of Some Organic Chemicals, Hydrazine and Hydrogen Peroxide (Part 1, Part 2, Part 3)

>> Volume 115: (2018) Some Industrial Chemicals

>> 2B, possibly carcinogenic to humans. (L135)

Health Effects:

>> Breathing hydrazines for short periods may cause coughing and irritation of the throat and lungs, convulsions, tremors, or seizures. Breathing hydrazines for long periods may cause liver and kidney damage, as well as serious effects on reproductive organs. Eating or drinking small amounts of hydrazines may cause nausea, vomiting, uncontrolled shaking, inflammation of the nerves, drowsiness, or coma. (L154)

Exposure Routes:

>> The substance can be absorbed into the body by inhalation, through the skin and by ingestion. Serious local effects by all routes of exposure.

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

Inhalation Exposure

>> Cough. Burning sensation. Headache. Confusion. Drowsiness. Nausea. Shortness of breath. Convulsions. Unconsciousness.

Skin Exposure

>> MAY BE ABSORBED! Redness. Pain. Skin burns.

Eye Exposure

>> Redness. Pain. Blurred vision. Severe burns.

Ingestion Exposure

>> Burns in mouth and throat. Abdominal pain. Diarrhoea. Vomiting. Shock or collapse. Further see Inhalation.

>> irritation eyes, skin, nose, throat; temporary blindness; dizziness, nausea; dermatitis; eye, skin burns; In Animals: bronchitis, pulmonary edema; liver, kidney damage; 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.

>> Cancer, Hepatic (Liver), Neurological (Nervous System), Renal (Urinary System or Kidneys), Reproductive (Producing Children), Respiratory (From the Nose to the Lungs)

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).

>> Hepatic

>> Respiratory

>> [in animals: tumors of the lungs, liver, blood vessels & intestine]

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.

>> Skin Sensitizer - An agent that can induce an allergic reaction in the skin.

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

>> IARC Carcinogen - Class 2: International Agency for Research on Cancer classifies chemicals as probable (2a), or possible (2b) human carcinogens.

>> NTP Carcinogen - Reasonably anticipated to be a human carcinogen.

>> ACGIH Carcinogen - Confirmed Animal.

Toxicity Data:

>> LC50 (rat) = 570 ppm/4H

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

>> Intermediate Inhalation: 0.004 ppm (L134)

Treatment:

Treatment when exposed to toxin

>> Induced emesis, gastric lavage, use of saline cathartics, or activated charcoal are commonly used to decrease the gastrointestinal absorption of hydrazines. In general, these treatments are most effective when used within a few hours after oral exposure. Following dermal or ocular exposures to hydrazines, all contaminated clothing should be removed, and contacted skin should be washed immediately with soap and water. Eyes that have come in contact with hydrazines should be flushed with copious amounts of water. Contact lenses should be removed prior to flushing with water. (L154)

Interactions:

>> The influence of gut microbiota on the toxicity and metabolism of hydrazine has been investigated in germ-free and 'conventional' Sprague Dawley rats using (1)H NMR based metabonomic analysis of urine and plasma. Toxicity was more severe in germ-free rats compared with conventional rats for equivalent exposures indicating that bacterial presence altered the nature or extent of response to hydrazine and that the toxic response can vary markedly in the absence of a functional microbiome.

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 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. /Hydrazine and Related Compounds/

Human Toxicity Excerpts:

>> /SIGNS AND SYMPTOMS/ Skin contact with anhydrous hydrazine leads to caustic-like burns and dissolves hair ... .

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Hydrazine is a model toxin that induces both hepatotoxic and neurotoxic effects in experimental animals. The direct biochemical effects of hydrazine in kidney, liver, and brain tissue were assessed in male Sprague-Dawley rats using magic angle spinning nuclear magnetic resonance (NMR) spectroscopy. A single dose of hydrazine (90 mg/kg) resulted in changes to the biochemical composition of the liver after 24 hr including an increase in triglycerides and beta-alanine, together with a decrease in hepatic glycogen, glucose, choline, taurine, and trimethylamine-N-oxide (TMAO). From histopathology measurements of liver tissue, minimal to mild hepatocyte alteration was observed in all animals at 24 hr. The NMR spectra of the renal cortex at 24 hr after dosing were dominated by a marked increase in the tissue concentration of 2-aminoadipate (2-AA) and beta-alanine, concomitant with depletions in TMAO, myo-inositol, choline, taurine, glutamate, and lysine. No alteration to the NMR spectral profile of the substantia nigra was observed after hydrazine administration, but perturbations to the relative concentrations of creatine, aspartate, myo-inositol, and N-acetyl aspartate were apparent in the hippocampus of hydrazine-treated animals at 24 hr postdose. No overt signs of histopathological toxicity were observed in either the kidney or the brain regions examined. Elevated alanine levels were observed in all tissues indicative of a general inhibition of alanine transaminase activity. By 168 hr postdose, NMR spectral profiles of treated rats appeared similar to those of matched controls for all tissue types indicative of recovery from toxic insult.

Non-Human Toxicity Values:

>> LD50 Rat oral 60 mg/kg

TSCA Test Submissions:

Under the Toxic Substances Control Act (TSCA), EPA has broad authority to issue regulations designed to require manufacturers (including importers) or processors to test chemical substances and mixtures for health and environmental effects. This section provides information on test reports submitted for this chemical under TSCA.

>> Hydrazine (CAS# 302-01-2) was evaluated for acute inhalation toxicity. The test substance was administered as saturated vapors to rats (strain, sex, and number not reported) for 30 minutes resulting in 17% mortality. Clinical signs included restlessness, nasal bleeding, salivation, and convulsions. Pathological findings included lesions of the bronchiolar mucosa.

Populations at Special Risk:

>> The effects of acetylation phenotypes on the metabolism of hydrazine /were investigated/. Genotypes of N-acetyl transferases, NAT2*, were determined using polymerase chain reaction for 297 male workers. Biological and exposure monitoring were also conducted. The rapid and intermediate acetylators accounted for 45% each, and the slow acetylators accounted for 10%. Biological half-lives were significantly different among the three acetylation phenotypes (analysis of variance, P < 0.05): 3.94+/-1.70 hours for slow acetylators, 2.25+/-0.37 hours for intermediate acetylators, and 1.86+/-0.67 hours for rapid acetylators. Among Japanese, rapid and intermediate acetylators are the major phenotypes, which is in sharp contrast with those among Caucasians./The authors/ conclude that biological monitoring should take genetic factors, which may vary dramatically among different populations, into account.

12. Ecological Information

Resident Soil (mg/kg)

>> 3.20e-02

Industrial Soil (mg/kg)

>> 1.40e-01

Resident Air (ug/m3)

>> 5.70e-04

Industrial Air (ug/m3)

>> 2.50e-03

Tapwater (ug/L)

>> 1.10e-03

MCL (ug/L)

>> 5.00e+01

Risk-based SSL (mg/kg)

>> 2.2e-07

Oral Slope Factor (mg/kg-day)-1

>> 3.00e+00

Inhalation Unit Risk (ug/m3)-1

>> 4.90e-03

Chronic Inhalation Reference Concentration (mg/m3)

>> 3e-05

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

Soil Saturation Concentration (mg/kg)

>> 1.12e+05

ICSC Environmental Data:

>> The substance is very toxic to aquatic organisms. It is strongly advised not to let the chemical enter into the environment.

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. Collect leaking liquid in sealable non-metallic containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT absorb in saw-dust or other combustible absorbents.

Disposal Methods

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number U133, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

>> Product: Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material; Contaminated packaging: Dispose of as unused product.

>> SRP: Wastewater from contaminant suppression, cleaning of protective clothing/equipment, or contaminated sites should be contained and evaluated for subject chemical or decomposition product concentrations. Concentrations shall be lower than applicable environmental discharge or disposal criteria. Alternatively, pretreatment and/or discharge to a permitted wastewater treatment facility is acceptable only after review by the governing authority and assurance that "pass through" violations will not occur. Due consideration shall be given to remediation worker exposure (inhalation, dermal and ingestion) as well as fate during treatment, transfer and disposal. If it is not practicable to manage the chemical in this fashion, it must be evaluated in accordance with EPA 40 CFR Part 261, specifically Subpart B, in order to determine the appropriate local, state and federal requirements for disposal.

>> Hydrazine is a waste chemical stream constituent which may be subjected to ultimate disposal by controlled incineration with facilities for effluent scrubbing to abate any ammonia formed in the combustion process.

>> For more Disposal Methods (Complete) data for Hydrazine (14 total), please visit the HSDB record page.

14. Transport Information

DOT

Hydrazine
8
UN Pack Group: I
Reportable Quantity of 1 lb or 0

IATA

Hydrazine
8, 3 and 6.1
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)

>> Hydrazine

Release: Minimum Concentration (%)

>> 1

Release: Screening Threshold Quantities (in pounds)

>> 10000

Security Issue: Release - Flammables

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

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Hydrazine

REACH Registered Substance

>> Status: Active Update: 11-01-2023 https://echa.europa.eu/registration-dossier/-/registered-dossier/14983

>> Status: Active Update: 02-04-2019 https://echa.europa.eu/registration-dossier/-/registered-dossier/28019

REACH Substances of Very High Concern (SVHC)

>> Substance: Hydrazine

>> EC: 206-114-9

>> Date of inclusion: >20-Jun-2011

>> Reason for inclusion: Carcinogenic (Article 57a)

New Zealand EPA Inventory of Chemical Status

>> Hydrazine, anhydrous: HSNO Approval: HSR001446 Approved with controls

16. Other Information

Toxic Combustion Products:

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

>> Poisonous gases, including ammonia fumes, hydrogen and nitrogen oxides, are produced in fire.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Hydrazine: Human health tier II assessment