TCI AMERICA

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	**Flammable material; avoid heat and sources of ignition.** **Corrosive to eyes and skin on contact.** **Harmful compound, minimize exposure.** **POSSIBLE CARCINOGEN. MINIMIZE EXPOSURE.**	

Section I. Chemical Product and Company Identification

Chemical Name: **2,4-Dinitrophenylhydrazine**
(contains HCl) Ethanol Solution [for TLC Stain]

Catalog Number: D2968

Synonym: Not available.

Chemical Formula: $C_6H_6N_4O_4$

CAS Number: 119-26-6
64-17-5 (Ethanol)
7732-18-5 (Water)
7647-01-0 (Hydrochloric Acid)

Supplier: TCI America
9211 N. Harborgate St.
Portland OR
1-800-423-8616

In case of Emergency Call: **Chemtrec®**
(800) 424-9300 (U.S.)
(703) 527-3887 (International)

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
2,4-Dinitrophenylhydrazine (contains HCl) Ethanol Solution [for TLC Stain]	119-26-6 64-17-5 (Ethanol) 7732-18-5 (Water) 7647-01-0 (Hydrochloric Acid)	ca. 9.0% ca. 61.0% (Ethanol) ca. 29.0% (Water) ca. 1.0% (Hydrochloric Acid)	This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen.	(2,4-Dinitrophenylhydrazine) Mouse LD_{50} (intraperitoneal) 450 mg/kg (Ethanol) Rat LC_{50} (inhalation) 20000 ppm/10H Rat LD_{50} (oral) 7060 mg/kg Mouse LD_{50} (oral) 3450 mg/kg (Water) Rat LD_{50} (oral) >90 ml/kg Mouse LD_{50} (intraperitoneal) 190 gm/kg Mouse LD_{50} (intravenous) 25 gm/kg (Hydrochloric Acid) Rabbit LD_{50} (oral) 900 mg/kg Rat LD_{50} (inhalation) 3124 ppm/1H Mouse LD_{50} (inhalation) 1108 ppm/1H

Section III. Hazards Identification

Acute Health Effects

Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested.
Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death.
Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Chronic Health Effects

CARCINOGENIC EFFECTS : Not available.
MUTAGENIC EFFECTS : Not available.
TERATOGENIC EFFECTS : Tumorigenic Effects. (Ethanol)
Mouse TD Oral 400 gm/kg/57 weeks intermittent
TOXIC EFFECTS:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria
Gastrointestinal - Tumors
Mouse TDLo Oral 320 mg/kg/50 weeks intermittent
TOXIC EFFECTS:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria
Liver - Tumors
Blood - Lymphomas including Hodgkin's disease
Mouse TDLo Rectal 120 gm/kg/18 weeks intermittent
TOXIC EFFECTS:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria
Gastrointestinal - Tumors
Liver - Tumors
DEVELOPMENTAL TOXICITY: Reproductive Effects. (Ethanol)
Rat TDLo Intraperitoneal 600 mg/kg, female 8-15 days of pregnancy
TOXIC EFFECTS:
Effects on Fertility - Post implantation mortality
Effects on Embryo or Fetus - Extra embryonic structures
Effects on Embryo or Fetus - Fetotoxicity
Rat TDLo Oral 135 gm/kg, female 1 day of pregnancy - 7 days after birth
TOXIC EFFECTS:
Effects on Newborn - Behavioral
Effects on Newborn - Physical

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Emergency phone number (800) 424-9300

Rat TDLo Oral 147 mg/kg, female 1-21 days of pregnancy
TOXIC EFFECTS:
Specific Developmental Abnormalities - Endocrine System
Effects on Newborn - Delayed effects
DEVELOPMENTAL TOXICITY: Reproductive Effects. (Hydrochloric Acid)
Rat TCLo Inhalation 450 mg/m3/1 hour, female 1 day prior to mating
TOXIC EFFECTS:
Effects on Embryo or Fetus - Fetotoxicity
Specific Developmental Abnormalities - Homeostasis

Section IV. First Aid Measures

Eye Contact
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact
In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Inhalation
If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.

Ingestion
DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive.

Section V. Fire and Explosion Data

Flammability
Flammable.

Auto-Ignition
363°C (685.4°F) (Ethanol)

Flash Points
14°C (57.2°F) (Ethanol)

Flammable Limits
LOWER: 3.3% UPPER: 19% (Ethanol)

Combustion Products
These products include toxic carbon oxides (CO,CO_2), nitrogen oxides (NO_x), halogenated compounds.
WARNING: Highly toxic HCl gas is produced during combustion.

Fire Hazards
Not available.

Explosion Hazards
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions
Flammable liquid.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use alcohol foam, water spray or fog.
Consult with local fire authorities before attempting large scale fire-fighting operations.

Section VI. Accidental Release Measures

Spill Cleanup Instructions
Flammable material. Corrosive material. Harmful material. Possibly carcinogenic material.
Keep away from heat. Mechanical exhaust required. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. DO NOT get water inside container. DO NOT touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Consult federal, state, and/or local authorities for assistance on disposal.

Section VII. Handling and Storage

Handling and Storage Information
FLAMMABLE. CORROSIVE. HARMFUL. POSSIBLE CARCINOGEN. Keep container dry. Keep away from heat. Mechanical exhaust required. Avoid excessive heat and light. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. Wear suitable protective clothing. If you feel unwell, seek medical attention and show the label when possible. Treat symptomatically and supportively.
Always store away from incompatible compounds such as oxidizing agents, reducing agents, organic materials, alkalis (bases).

Section VIII. Exposure Controls/Personal Protection

Engineering Controls
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location.

Personal Protection
Face shield. Lab coat. Vapor respirator. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. Be sure to use a MSHA/NIOSH approved respirator or equivalent.

Exposure Limits
This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen.

Section IX. Physical and Chemical Properties

Physical state @ 20°C
Liquid. (Clear, reddish-yellow.)

Specific Gravity
0.79 (water=1) (Ethanol)
1.0 (water=1) (Water)
1.2 (water=1) (Hydrochloric Acid)

Molecular Weight
$C_6H_6N_4O_4$=198.14
(2,4-Dinitrophenylhydrazine)
C_2H_6O=46.07 (Ethanol)
H_2O=18.02 (Water)
HCl=36.46 (Hydrochloric Acid)

Solubility
(2,4-Dinitrophenylhydrazine)
Slightly soluble in water, alcohol.
Moderately soluble in diluted inorganic acids.
Readily soluble in diglyme.

Partition Coefficient
LOG P_{ow}: -0.32 (Ethanol)
LOG P_{ow}: 0.25 (Hydrochloric Acid)

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Boiling Point	78 to 80°C (172.4 to 176°F) (Ethanol) 100°C (212°F) (Water) -85°C (-121°F) (Hydrochloric Acid)	Vapor Pressure	5.8 kPa (@ 20°C) (Ethanol) 0.2 kPa (@ 20°C) (Hydrochloric Acid)
Melting Point	200-202°C (392 to 395.6°F) (2,4-Dinitrophenylhydrazine) -114.22°C (-173.6°F) (Hydrochloric Acid)	Vapor Density	1.6 g/l (Air = 1) (Ethanol) 1.3 g/l (Air = 1) (Hydrochloric Acid)
Refractive Index	1.333 (Water)	Volatility	Not available.
Critical Temperature	Not available.	Odor	Characteristic.
Viscosity	Not available.	Taste	Not available.

Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light.
Incompatibilities	Reactive with strong oxidizing agents, reducing agents, organic materials, alkalis (bases),peroxides, ammonia, alkali metals, halides.

Section XI. Toxicological Information

RTECS Number

MV3325000 (2,4-Dinitrophenylhydrazine)
KQ6300000 (Ethanol)
ZC0110000 (Water)
MW4025000 (Hydrochloric Acid)

Routes of Exposure

Eye Contact. Ingestion. Inhalation. Skin contact.

Toxicity Data

(2,4-Dinitrophenylhydrazine)
Mouse LD_{50} (intraperitoneal) 450 mg/kg
(Ethanol)
Rat LC_{50} (inhalation) 20000 ppm/10H
Rat LD_{50} (oral) 7060 mg/kg
Mouse LD_{50} (oral) 3450 mg/kg
(Water)
Rat LD_{50} (oral) >90 ml/kg
Mouse LD_{50} (intraperitoneal) 190 gm/kg
Mouse LD_{50} (intravenous) 25 gm/kg
(Hydrochloric Acid)
Rabbit LD_{50} (oral) 900 mg/kg
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Chronic Toxic Effects

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Acute Toxic Effects	Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	(Ethanol) Ethanol's production and use in alcoholic beverages, as a solvent, fuel additive, in the manufacture of denatured alcohol, pharmaceuticals (rubbing compounds, tonics, lotions, colognes), in perfumery, and organic synthesis may result in its release to the environment through various waste streams; it's use as a fungicide and plant regulator will result in its direct release to the environment. Ethanol has been identified as a natural emission product from various plants, fermentation product and as a biological decomposition product of wastes and sewage. If released to the atmosphere, an extrapolated vapor pressure of 59.3 mm Hg at 25 deg C indicates that ethanol will exist solely in the vapor phase. Vapor phase ethanol is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 5 days. If released to soil, ethanol is expected to have very high mobility based upon an estimated Koc of 1. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 5X10-6 atm-cu m/mole. Ethanol may also volatilize from dry soils based upon it vapor pressure. Biodegradation is expected to occur rapidly in the environment based on numerous screening tests using different types of inocula and incubation periods. Ethanol was degraded with half-lives on the order of a few days using microcosms constructed with a low organic sandy soil and groundwater, indicating it is unlikely to be persistent in the environment. If released into water, ethanol is not expected to adsorb to suspended solids and sediment based upon the estimated Koc. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 3 and 39 days, respectively. An estimated BCF of 3 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis of ethanol and photolysis in sunlit surface waters are not expected since ethanol lacks functional groups that are susceptible to hydrolysis or photolysis under environmental conditions. Occupational exposure to ethanol may occur through inhalation and dermal contact with this compound at workplaces where ethanol is produced or used. The general population is directly exposed to ethanol through the consumption of alcoholic beverages and other products that contain ethanol. Monitoring data also indicate that the general population may be exposed to ethanol via inhalation of ambient air. (Hydrochloric Acid) Hydrogen chloride and hydrochloric acid's production and use in the production of chemicals, or for applications such as a metal pickling, ore refining, food processing, manufacture of fertilizers and dyes, and in the rubber and textile industries may result in the release of hydrogen chloride or hydrochloric acid to the environment through various waste streams. Hydrogen chloride can be formed during the burning of many plastics. Hydrochloric acid is found in the gases evolved from volcanoes, particularly ones found in Mexico and South America. Hydrochloric acid is also found in the digestive tract of most mammals. If released to air, hydrogen chloride will be removed by rainfall. If released to water, hydrogen chloride dissociates readily in water to chloride and hydronium ions, decreasing the pH of the water. A Henry's law constant of 2.04X10+6 mol/L atm (4.90X10-10 cu m atm/mol) has been reported for hydrochloric acid. This Henry's Law constant indicates that hydrochloric acid is expected to be essentially nonvolatile from water surfaces. If released to soil, hydrogen chloride will evaporate from dry soil surfaces and dissociate into chloride and hydronium ions in moist soil. Hydrogen chloride does not accumulate in the food chain. Occupational exposure to hydrogen chloride or hydrochloric acid may occur through inhalation and dermal contact with these compounds at workplaces where hydrogen chloride or hydrochloric acid is produced or used. Use data indicate that the general population may be exposed to hydrogen chloride or hydrochloric acid via inhalation and dermal contact with consumer products products containing these compounds.

Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.

Section XIV. Transport Information

DOT Classification	DOT Class 3: Flammable liquid DOT Class 8: Corrosive material
PIN Number	UN2924
Proper Shipping Name	Flammable liquid, corrosive, n.o.s.
Packing Group (PG)	II
DOT Pictograms	

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is **ON** the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS E: Corrosive liquid. On DSL
EINECS Number (EEC)	204-309-3 (2,4-Dinitrophenylhydrazine) 200-578-6 (Ethanol) 231-791-2 (Water) 231-595-7 (Hydrochloric Acid)
EEC Risk Statements	

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	R10- Flammable. R18- In use, may form flammable/explosive vapor-air mixture. R20/21/22- Harmful by inhalation, in contact with skin and if swallowed. R34- Causes burns. R45- May cause cancer.
Japanese Regulatory Data	ENCS No. 3-478 (2,4-Dinitrophenylhydrazine) ENCS No. 2-202 (Ethanol) ENCS No. 1-215 (Hydrochloric Acid)

Section XVI. Other Information

Version 1.0
Validated on 5/7/2009.
Printed 5/7/2009.

Notice to Reader

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.