

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
  	<p>Environmental hazard. This material is very toxic to aquatic organisms and may cause long term adverse effects to the aquatic environment. Toxic compound, do not ingest or inhale. Avoid all contact with this material. CARCINOGEN. MINIMIZE EXPOSURE. MUTAGEN. MINIMIZE EXPOSURE. Store under nitrogen. Refrigerate.</p>	   

Section I. Chemical Product and Company Identification

Chemical Name	Hydrazobenzene		
Catalog Number	H0180	Supplier	TCI America 9211 N. Harborgate St. Portland OR 1-800-423-8616
Synonym	1,2-Diphenylhydrazine (9CI)		
Chemical Formula	C ₁₂ H ₁₂ N ₂		
CAS Number	122-66-7		
		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
Hydrazobenzene	122-66-7	Min. 95.0 (Tit.)	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen. This compound is classified as a mutagen. There is no acceptable exposure limit for a mutagen.	Rat LD ₅₀ (oral) 301 mg/kg

Section III. Hazards Identification

Acute Health Effects	Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.
Chronic Health Effects	<p>CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Tumorigenic Effects: Rat TDLo Oral 2620 mg/kg/78 weeks continuous. TOXIC Effects: Tumorigenic – Carcinogenic by RTECS criteria. Liver – Tumors. Skin and Appendages – Tumors. Rat TD Subcutaneous 6 gm/kg/27 weeks intermittent. TOXIC Effects: Tumorigenic – Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages – Tumors. Tumorigenic Effects – Uterine tumors. Rat TD Subcutaneous 16gm/kg/1 year intermittent. TOXIC Effects: Tumorigenic – Equivocal tumorigenic agent by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste) – Tumors. DEVELOPMENTAL TOXICITY : Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.</p>

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 for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
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.

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Emergency phone number (800) 424-9300

Ingestion

INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. 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	May be combustible at high temperature.	Auto-Ignition	Not available.
Flash Points	Not available.	Flammable Limits	Not available.
Combustion Products	These products are toxic carbon oxides (CO, CO ₂), nitrogen oxides (NO, NO ₂).		
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	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. Consult with local fire authorities before attempting large scale fire-fighting operations.		

Section VI. Accidental Release Measures

Spill Cleanup Instructions	Environmentally hazardous material. Toxic material. Carcinogenic material. Mutagenic material. Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Consult federal, state, and/or local authorities for assistance on disposal.
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Section VII. Handling and Storage

Handling and Storage Information	ENVIRONMENTAL HAZARD. TOXIC. CARCINOGEN. MUTAGEN. STORE UNDER NITROGEN. REFRIGERATE. Keep locked up. Keep away from heat. Mechanical exhaust required. When not in use, tightly seal the container and store in a dry, cool place. Avoid excessive heat and light. DO NOT ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents, acids.
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Section VIII. Exposure Controls/Personal Protection

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
	
Exposure Limits	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen. This compound is classified as a mutagen. There is no acceptable exposure limit for a mutagen.

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Solid. (Light Yellow Crystal.)	Solubility	Very soluble in ethanol. Soluble in hot methanol. Slightly soluble in benzene, deuterated dimethyl sulfoxide. Very slightly soluble in water. Insoluble in acetic acid.
Specific Gravity	1.158 (water=1)	Partition Coefficient	Log K _{ow} : 2.94
Molecular Weight	184.24	Vapor Pressure	133 Pa @ 103°C
Boiling Point	293°C (559.4°F)	Vapor Density	Not available.
Melting Point	123 to 126°C (253.4 to 258.8°F)	Volatility	Not available.
Refractive Index	Not available.	Odor	Not available.
Critical Temperature	Not available.	Taste	Not available.
Viscosity	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, strong acids, acid chlorides, acid anhydrides.

Section XI. Toxicological Information

RTECS Number	MW2625000
Routes of Exposure	Eye Contact. Ingestion. Inhalation.
Toxicity Data	Rat LD ₅₀ (oral) 301 mg/kg
Chronic Toxic Effects	<p>CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Tumorigenic Effects: Rat TDLo Oral 2620 mg/kg/78 weeks continuous. TOXIC Effects: Tumorigenic – Carcinogenic by RTECS criteria. Liver – Tumors. Skin and Appendages – Tumors. Rat TD Subcutaneous 6 gm/kg/27 weeks intermittent. TOXIC Effects: Tumorigenic – Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages – Tumors. Tumorigenic Effects – Uterine tumors. Rat TD Subcutaneous 16gm/kg/1 year intermittent. TOXIC Effects: Tumorigenic – Equivocal tumorigenic agent by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste) – Tumors. DEVELOPMENTAL TOXICITY : Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.</p>
Acute Toxic Effects	<p>Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p>

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	<p>1,2-Diphenylhydrazine's production and use as a chemical intermediate may result in its release to the environment through various waste streams. It may also be produced in wastewater receiving azobenzene where conditions are reducing. If released to air, a vapor pressure of 4.4X10⁻⁴ mm Hg at 25 deg C indicates that 1,2-diphenylhydrazine will exist in both the vapor and particulate phases in the ambient atmosphere. Vapor-phase 1,2-diphenylhydrazine is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals with an estimated half-life of about 5 hours. Particulate-phase 1,2-diphenylhydrazine may be physically removed from the air by wet and dry deposition. 1,2-Diphenylhydrazine absorbs light greater than 290 nm and may be susceptible to direct photolysis; however, the rate of this potential reaction is not known. If released to soil 1,2-diphenylhydrazine is expected to have low mobility based upon an estimated Koc of 950. Volatilization from moist soil surfaces is not expected to be an important fate process based upon an estimated Henry's Law constant of 4.8X10⁻⁷ atm-cu m/mole. 1,2-Diphenylhydrazine is not expected to volatilize from dry soil surfaces based on its vapor pressure. If released to water 1,2-diphenylhydrazine is expected to adsorb to suspended solids and sediment based on the estimated Koc value. Volatilization from water surfaces is not expected to be an important environmental fate process based on the estimated Henry's Law constant. 1,2-Diphenylhydrazine is rapidly oxidized to azobenzene in aerobic solutions and the reaction is catalyzed by common environmental cations such as copper(II) and iron(III). This reaction is reversible. Under oxidizing conditions (such as well aerated surface waters) the formation of azobenzene is favored, while under reducing conditions (such as anaerobic sediment), conversion back to 1,2-diphenylhydrazine is favored. Degradation of this compound may result from photolysis and possibly biodegradation, but these processes should be slow as compared with oxidation to azobenzene under aerobic conditions. A BCF value of 29 measured in fish and shellfish suggests that bioconcentration in aquatic organisms is low. Occupational exposure may occur through inhalation or dermal contact at workplaces where 1,2-diphenylhydrazine is produced or used. Phenylbutazone, a drug used for the treatment of inflammatory conditions such as arthritis and sulfapyrazone, a drug used to treat gouty arthritis are synthesized from 1,2-diphenylhydrazine and have been shown to hydrolyze to 1,2-diphenylhydrazine. Therefore, low levels of exposure to 1,2-diphenylhydrazine may exist for patients using these anti-inflammatory drugs. However, this drug is primarily used as a veterinary medication and its current use in humans is unknown.</p>

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.
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Section XIV. Transport Information

DOT Classification	DOT Class 9: Miscellaneous hazardous material.
PIN Number	UN3077
Proper Shipping Name	Environmentally hazardous substance, solid, n.o.s.
Packing Group (PG)	III
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 D-1B: Material causing immediate and serious toxic effects (TOXIC). On NDSL.
EINECS Number (EEC)	204-563-5
EEC Risk Statements	R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. R45- May cause cancer. R46- May cause heritable genetic damage. R47- May cause birth defects. R50- Very toxic to aquatic organisms. R53- May cause long-term adverse effects in the aquatic environment.
Japanese Regulatory Data	ENCS No. (3)-2755

Section XVI. Other Information

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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.