TCI AMERICA

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	Highly toxic compound, do not ingest or inhale. Avoid all contact with this material. **Environmental hazard.** **This material is toxic to aquatic organisms and may cause long term adverse effects to the aquatic environment.** **Irritating to skin, eyes, and the respiratory system.**	

Section I. Chemical Product and Company Identification

Chemical Name **Phthalonitrile**

Catalog Number	P0404
Synonym	1,2-Dicyanobenzene
Chemical Formula	$C_8H_4N_2$
CAS Number	91-15-6

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
Phthalonitrile	91-15-6	Min. 99.0 (GC)	Not available.	Rat LD_{50} (intraperitoneal) 62 mg/kg Rat LD_{50} (oral) 30 mg/kg Mouse LD_{50} (subcutaneous) 46 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. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Chronic Health Effects

CARCINOGENIC EFFECTS : Equivocal tumorigenic agent by RTECS criteria.
MUTAGENIC EFFECTS : Not available.
TERATOGENIC EFFECTS : Tumorigenic Effects:
Rat TDLo (Oral) 7425 mg/kg/66 weeks intermittent
Toxic Effects:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria
Liver - Tumors
Blood - Leukemia
Rat TDLo (Subcutaneous) 473 mg/kg/21 weeks intermittent
Toxic Effects:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria
Liver - Tumors
Blood - Leukemia
Mouse TDLo (Skin) 813 mg/kg/46 weeks intermittent
Toxic Effects:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria
Blood - Leukemia
Tumorigenic effects - Ovarian 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.

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.

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.

Continued on Next Page *Emergency phone number (800) 424-9300*

Section V. Fire and Explosion Data

Flammability	May be combustible at high temperature.	Auto-Ignition	Not available.
Flash Points	162℃ (323.6℉).	Flammable Limits	Not available.
Combustion Products	These products are toxic carbon oxides (CO, CO_2), nitrogen oxides (NO, NO_2). WARNING: Very toxic cyanide gas may be produced in a fire. Do not inhale.		
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	Highly toxic material. Environmentally hazardous material. Irritating 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.

Section VII. Handling and Storage

Handling and Storage Information	HIGHLY TOXIC. ENVIRONMENTAL HAZARD. IRRITANT. 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, reducing agents, acids, alkalis (bases).

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	Not available.

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Solid. (Crystal, powder. White - almost white.)	Solubility	Soluble in benzene, acetone, ether, alcohol, hot methanol. Very slightly soluble in water (0.4 g/L 25℃)
Specific Gravity	Not available.		
Molecular Weight	128.13	Partition Coefficient	LOG P_{ow}: 0.99
Boiling Point	Not available.	Vapor Pressure	5.0 Pa/20℃
Melting Point	140℃ (284℉)	Vapor Density	4.42 (Air = 1)
Refractive Index	Not available.	Volatility	Not available.
Critical Temperature	Not available.	Odor	Weakly, aromatic.
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, strong reducing agents, strong acids, strong alkalis (bases).

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Section XI. Toxicological Information

RTECS Number	TI8575000
Routes of Exposure	Eye Contact. Ingestion. Inhalation.
Toxicity Data	Rat LD_{50} (intraperitoneal) 62 mg/kg Rat LD_{50} (oral) 30 mg/kg Mouse LD_{50} (subcutaneous) 46 mg/kg
Chronic Toxic Effects	**CARCINOGENIC EFFECTS** : Equivocal tumorigenic agent by RTECS criteria. **MUTAGENIC EFFECTS** : Not available. **TERATOGENIC EFFECTS** : Tumorigenic Effects: Rat TDLo (Oral) 7425 mg/kg/66 weeks intermittent Toxic Effects: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Liver - Tumors Blood - Leukemia Rat TDLo (Subcutaneous) 473 mg/kg/21 weeks intermittent Toxic Effects: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Liver - Tumors Blood - Leukemia Mouse TDLo (Skin) 813 mg/kg/46 weeks intermittent Toxic Effects: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Blood - Leukemia Tumorigenic effects - Ovarian 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.
Acute Toxic Effects	Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	1,2-Benzenedicarbonitrile's production and use as an intermediate in organic synthesis (esp, pigments and dyes) and as a base material for high temperature lubricants and coatings may result in its release to the environment through various waste streams. If released to air, a vapor pressure of 3.75X10-2 mm Hg at 20 deg C indicates 1,2-benzenedicarbonitrile will exist solely as a vapor in the ambient atmosphere. Vapor-phase 1,2-benzenedicarbonitrile will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 356 days. If released to soil, 1,2-benzenedicarbonitrile is expected to have high mobility based upon an estimated Koc of 82. Volatilization from moist soil surfaces is not expected to be an important fate process based upon an estimated Henry's Law constant of 5.0X10-7 atm-cu m/mole. If released into water, 1,2-benzenedicarbonitrile is not expected to adsorb to suspended solids and sediment based upon the estimated Koc. Volatilization from water surfaces is not expected to be an important fate process based upon this compound's estimated Henry's Law constant. A range of BCF values from 0.8 to <5.5 for carp suggest the potential for bioconcentration in aquatic organisms is low. Chemical hydrolysis of 1,2-benzenedicarbonitrile is expected to be slow. Occupational exposure to 1,2-benzenedicarbonitrile may occur through dermal contact with this compound at workplaces where 1,2-benzenedicarbonitrile is produced or used.

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 6.1: Toxic material.
PIN Number	UN3439
Proper Shipping Name	Nitriles, toxic, solid, n.o.s.
Packing Group (PG)	II
DOT Pictograms	

Continued on Next Page Emergency phone number (800) 424-9300

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 DSL.
EINECS Number (EEC)	202-044-8
EEC Risk Statements	R26/27/28- Very toxic by inhalation, in contact with skin and if swallowed. R51- Toxic to aquatic organisms. R53- May cause long-term adverse effects in the aquatic environment. R36/37/38- Irritating to eyes, respiratory system and skin.
Japanese Regulatory Data	ENCS no.: 3-1799

Section XVI. Other Information

Version 1.0
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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.