

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
  	<p>Toxic compound, do not ingest or inhale. Avoid all contact with this material.</p> <p>Irritating to skin, eyes, and the respiratory system.</p> <p>POSSIBLE CARCINOGEN. MINIMIZE EXPOSURE.</p> <p>Environmental hazard.</p> <p>This material is toxic to aquatic organisms and may cause long term adverse effects to the aquatic environment.</p>	   

Section I. Chemical Product and Company Identification

Chemical Name	4-Nitrotoluene		
Catalog Number	N0276	Supplier	TCI America 9211 N. Harborage St. Portland OR 1-800-423-8616
Synonym	Benzene, 1-methyl-4-nitro- (CA INDEX NAME)		
Chemical Formula	C ₇ H ₇ NO ₂		
CAS Number	99-99-0	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
4-Nitrotoluene	99-99-0	Min. 99.0 (GC)	This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen.	Rat LD ₅₀ (oral) 1960 mg/kg Rat LD ₅₀ (dermal) >16 gm/kg Rat LD ₅₀ (inhalation) 975 mg/m ³

Section III. Hazards Identification

Acute Health Effects	<p>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.</p> <p>Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p>
Chronic Health Effects	<p>CARCINOGENIC EFFECTS : Not available.</p> <p>MUTAGENIC EFFECTS : Not available.</p> <p>TERATOGENIC EFFECTS : Tumorigenic effects.</p> <p>Rat TDLo Oral 80850 mg/kg for 105 weeks continuous</p> <p>TOXIC EFFECTS:</p> <p>Tumorigenic - Equivocal tumorigenic agent by RTECS criteria</p> <p>Skin and Appendages - Tumors</p> <p>Rat TDLo Oral 91875 mg/kg for 105 weeks continuous</p> <p>TOXIC EFFECTS:</p> <p>Tumorigenic - Equivocal tumorigenic agent by RTECS criteria</p> <p>Tumorigenic Effects - Other reproductive system tumors</p> <p>Rat TDLo Oral 91.3 gm/kg for 2 years continuous</p> <p>TOXIC EFFECTS:</p> <p>Tumorigenic - Equivocal tumorigenic agent by RTECS criteria</p> <p>Tumorigenic Effects - Other reproductive system tumors</p> <p>DEVELOPMENTAL TOXICITY: Reproductive effects.</p> <p>Rat TDLo Intraperitoneal 30 mg/kg, female 1 day prior to mating</p> <p>TOXIC EFFECTS:</p> <p>Maternal Effects - Uterus, cervix, vagina</p> <p>Rat TDLo Oral 65793 mg/kg, male 13 weeks prior to mating</p> <p>TOXIC EFFECTS:</p> <p>Paternal Effects - Spermatogenesis</p> <p>Paternal Effects - Testes, epididymis, sperm duct</p> <p>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.
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	450 °C (842 °F)
Flash Points	106 °C (222.8 °F)	Flammable Limits	LOWER: 1.6%
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	Toxic material. Irritating material. Possibly carcinogenic material. Environmentally hazardous 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	TOXIC. IRRITANT. POSSIBLE CARCINOGEN. ENVIRONMENTAL HAZARD. 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.
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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 possible carcinogen. There is no acceptable exposure limit for a carcinogen.

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Solid. (Light yellow crystal ~ crystalline powder.)	Solubility	Soluble in methanol, alcohol, ether, benzene, chloroform, acetone. Insoluble in water (0.035 g/100 mL 20°C).
Specific Gravity	1.29 (water=1)		
Molecular Weight	137.14	Partition Coefficient	LOG P _{ow} : 2.41
Boiling Point	238 °C (460.4 °F)	Vapor Pressure	Not applicable.
Melting Point	53 °C (127.4 °F)	Vapor Density	4.72 (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 oxidizing agents, reducing agents, acids, alkalis (bases).

Section XI. Toxicological Information

RTECS Number	XT3325000
Routes of Exposure	Eye Contact. Ingestion. Inhalation.
Toxicity Data	Rat LD ₅₀ (oral) 1960 mg/kg Rat LD ₅₀ (dermal) >16 gm/kg Rat LD ₅₀ (inhalation) 975 mg/m ³
Chronic Toxic Effects	CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Tumorigenic effects. Rat TDLo Oral 80850 mg/kg for 105 weeks continuous TOXIC EFFECTS: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Skin and Appendages - Tumors Rat TDLo Oral 91875 mg/kg for 105 weeks continuous TOXIC EFFECTS: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Tumorigenic Effects - Other reproductive system tumors Rat TDLo Oral 91.3 gm/kg for 2 years continuous TOXIC EFFECTS: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Tumorigenic Effects - Other reproductive system tumors DEVELOPMENTAL TOXICITY: Reproductive effects. Rat TDLo Intraperitoneal 30 mg/kg, female 1 day prior to mating TOXIC EFFECTS: Maternal Effects - Uterus, cervix, vagina Rat TDLo Oral 65793 mg/kg, male 13 weeks prior to mating TOXIC EFFECTS: Paternal Effects - Spermatogenesis Paternal Effects - Testes, epididymis, sperm duct 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	4-Nitrotoluene's production and use in the manufacture of chemicals for the dye industry (e.g., azo and sulfur dye intermediates such as p-toluidine, p-nitrobenzaldehyde, and 4-nitro-2-chlorotoluene) and explosives industry (e.g., dinitrotoluene, trinitrotoluene) may result in its release to the environment through various waste streams. If released to air, a vapor pressure of 0.164 mm Hg at 25 deg C indicates 4-nitrotoluene will exist solely as a vapor in the ambient atmosphere. Vapor-phase 4-nitrotoluene 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 21 days. 4-Nitrotoluene is also expected to undergo direct photolysis, with 4-methyl-2-nitrophenol being its primary photoproduct. If released to soil, 4-nitrotoluene is expected to have moderate mobility based upon an estimated Koc of 460. Volatilization from moist soil surfaces is expected to be a slow fate process based upon a Henry's Law constant of 5.63X10 ⁻⁶ atm-cu m/mole. The biodegradation of 4-nitrotoluene in soils has not been studied extensively; one study indicated that it persists for greater than 64 days using a silt loam soil inoculum. In anaerobic soils, 4-nitrotoluene has been observed to be degraded to toluidine, with little additional degradation. If released into water, 4-nitrotoluene is not expected to adsorb to suspended solids and sediment based upon its estimated Koc. 4-Nitrotoluene has been observed to be partially or completely degraded in aqueous sewage treatment systems, and completely degraded in aquifers, but not in rivers or streams. Half lives for degradation in the studied aquatic environments ranged from less than 3 days to greater than 60 days. Volatilization from water surfaces is not expected to be an important fate process based upon the Henry's Law constant. An estimated BCF of 13 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions. The most probable routes of human exposure to 4-nitrotoluene are inhalation and dermal contact of workers involved in the production and use of this compound, as well as in the production of dinitrotoluene and trinitrotoluene. Monitoring data indicate that the general population may be exposed to 4-nitrotoluene via inhalation of ambient air in the vicinity of production facilities and ingestion of drinking water.

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 6.1: Toxic material
PIN Number	UN3446
Proper Shipping Name	Nitrotoluenes, solid
Packing Group (PG)	II

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Emergency phone number (800) 424-9300

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 DSL.
EINECS Number (EEC)	202-808-0
EEC Risk Statements	R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. R36/37/38- Irritating to eyes, respiratory system and skin. R45- May cause cancer. R51- Toxic to aquatic organisms. R53- May cause long-term adverse effects in the aquatic environment.
Japanese Regulatory Data	ENCS No. 3-437

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.