

# Material Safety Data Sheet

## Nitrobenzene

### Section 1 - Chemical Product

**MSDS Name:** Nitrobenzene

**Synonyms:** Essence of mirbane; Mirbane oil; Nitrobenzol; Oil of mirbane; NTB.

### Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
98-95-3	Nitrobenzene	> 99	202-716-0

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: colorless to pale yellow liquid. Flash Point: 87 deg C.

**Danger!** May be fatal if swallowed. Harmful if absorbed through skin or if inhaled. May cause eye, skin, and respiratory tract irritation. **Combustible liquid and vapor.** Possible risk of impaired fertility. Methemoglobin formation is the principal cause of toxicity.

**Target Organs:** Blood, kidneys, heart, central nervous system, liver, spleen, bone marrow.

#### Potential Health Effects

**Eye:** May cause eye irritation. Vapors may cause eye irritation. May cause eye injury.

**Skin:** May cause skin irritation. Substance is rapidly absorbed through the skin. If absorbed, may cause symptoms similar to those for ingestion.

**Ingestion:** May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Effects may be delayed 2 to 4 hours. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood.

**Inhalation:** May cause effects similar to those described for ingestion.

**Chronic:** Prolonged or repeated exposure may cause adverse reproductive effects. May cause liver and kidney damage. May cause bone marrow abnormalities with damage to blood forming tissues. May cause fetal effects. May cause anemia and other blood cell

abnormalities. Repeated exposure may cause central nervous system damage. Repeated exposure may cause damage to the spleen.

## Section 4 - First Aid Measures

**Eyes:** Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

**Skin:** Get medical aid immediately. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

**Ingestion:** Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

**Inhalation:** Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

**Notes to Physician:** Absorption of this product into the body may cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). Moderate degrees of cyanosis need to be treated only by supportive measures: bed rest and oxygen inhalation. For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood. Cleansing of the entire contaminated area of the body is of utmost importance.

## Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Combustible liquid and vapor. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

**Extinguishing Media:** Use water spray, dry chemical, carbon dioxide, or appropriate foam.

**Flash Point:** 87 deg C ( 188.60 deg F)

**Autoignition Temperature:** 496 deg C ( 924.80 deg F)

**Explosion Limits, Lower:** 1.8%

**Upper:** Not available.

**NFPA Rating:** (estimated) Health: 3; Flammability: 2; Instability: 1

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Remove all sources of ignition. A vapor suppressing foam may be used to reduce vapors.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat and flame.

**Storage:** Keep away from sources of ignition. Do not store in direct sunlight. Store in a cool, dry, well-ventilated area away from incompatible substances.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Nitrobenzene	1 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	1 ppm TWA; 5 mg/m <sup>3</sup> TWA 200 ppm IDLH	1 ppm TWA; 5 mg/m <sup>3</sup> TWA

**OSHA Vacated PELs:** Nitrobenzene: 1 ppm TWA; 5 mg/m<sup>3</sup> TWA

### Personal Protective Equipment

**Eyes:** Wear chemical splash goggles.

**Skin:** Wear appropriate gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** colorless to pale yellow

**Odor:** almond-like

**pH:** Not available.

**Vapor Pressure:** < 1 mm Hg @ 20 deg C

**Vapor Density:** 4.25 (air=1)

**Evaporation Rate:** Not available.

**Viscosity:** Not available.

**Boiling Point:** 210-211 deg C @ 760 mm Hg

**Freezing/Melting Point:** 5 - 6 deg C

**Decomposition Temperature:** Not available.

**Solubility:** Insoluble.

**Specific Gravity/Density:** 1.2 g/cm<sup>3</sup>

**Molecular Formula:** C<sub>6</sub>H<sub>5</sub>NO<sub>2</sub>

**Molecular Weight:** 123.11

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable at room temperature in closed containers under normal storage and handling conditions.

**Conditions to Avoid:** High temperatures, incompatible materials, ignition sources.

**Incompatibilities with Other Materials:** Substance can dangerously react with nitric acid, phenol, aluminum chloride, aniline, glycerine, silver perchlorate, dinitrogen tetroxide, caustics, tin, and zinc.

**Hazardous Decomposition Products:** Nitrogen oxides, carbon monoxide, carbon dioxide.

**Hazardous Polymerization:** Has not been reported.

## Section 11 - Toxicological Information

**RTECS#:**

**CAS#** 98-95-3: DA6475000

**LD50/LC50:**

CAS# 98-95-3:

Draize test, rabbit, eye: 500 mg/24H Mild;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, rat: LC50 = 556 ppm/4H;

Oral, mouse: LD50 = 590 mg/kg;

Oral, rat: LD50 = 349 mg/kg;

Skin, rat: LD50 = 2100 mg/kg;

Oral human LDLo: 35 mg/kg.

**Carcinogenicity:**

CAS# 98-95-3:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
- **California:** carcinogen, initial date 8/26/97
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

**Epidemiology:** No information available.

**Teratogenicity:** Embryo or Fetus: Death, inhalation-rat TCLo=1260ug/m<sup>3</sup>/4H.

**Reproductive Effects:** Fertility: Pre-implantation mortality, inhalation-rat TCLo=1260ug/m<sup>3</sup>/4H. Paternal Effects: Prostate/seminal vesicle/Cowpers gland/urethra, inhalation-rat TCLo=40ppm/6H; Spermatogenesis and testes/sperm duct/epididymis,

oral-rat TDLo=300mg/kg.

**Mutagenicity:** No information available.

**Neurotoxicity:** No information available.

**Other Studies:**

## Section 12 - Ecological Information

**Ecotoxicity:** No data available. Zebrafish: LC50 = 112.5mg/L/96H Minnow (distilled water): LC50 = 20-24mg/L/6H Water flea: LC50 = 62mg/L/24H, 27mg/L/48H

**Environmental:** Substance has a low biological oxygen demand and is not predicted to cause oxygen depletion in aquatic systems. Substance is biodegradable and is not expected to persist in the environment. Substance has a low potential to bioconcentrate.

**Physical:** No information available.

**Other:** None.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:**

CAS# 98-95-3: waste number U169 (Ignitable waste, Toxic waste).

## Section 14 - Transport Information

	US DOT	Canada TDG
<b>Shipping Name:</b>	NITROBENZENE	NITROBENZENE
<b>Hazard Class:</b>	6.1	6.1
<b>UN Number:</b>	UN1662	UN1662
<b>Packing Group:</b>	II	II

## Section 15 - Regulatory Information

### US FEDERAL

#### TSCA

CAS# 98-95-3 is listed on the TSCA inventory.

#### Health & Safety Reporting List

CAS# 98-95-3: Effective 10/4/82, Sunset 10/4/92

**Chemical Test Rules**

None of the chemicals in this product are under a Chemical Test Rule.

**Section 12b**

None of the chemicals are listed under TSCA Section 12b.

**TSCA Significant New Use Rule**

None of the chemicals in this material have a SNUR under TSCA.

**CERCLA Hazardous Substances and corresponding RQs**

CAS# 98-95-3: 1000 lb final RQ; 454 kg final RQ

**SARA Section 302 Extremely Hazardous Substances**

CAS# 98-95-3: 10000 lb TPQ

**SARA Codes**

CAS # 98-95-3: immediate, delayed, fire.

**Section 313**

This material contains Nitrobenzene (CAS# 98-95-3, > 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

**Clean Air Act:**

CAS# 98-95-3 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

**Clean Water Act:**

CAS# 98-95-3 is listed as a Hazardous Substance under the CWA. CAS# 98-95-3 is listed as a Priority Pollutant under the Clean Water Act. CAS# 98-95-3 is listed as a Toxic Pollutant under the Clean Water Act.

**OSHA:**

None of the chemicals in this product are considered highly hazardous by OSHA.

**STATE**

CAS# 98-95-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

**California Prop 65****The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:**

WARNING: This product contains Nitrobenzene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations****European Labeling in Accordance with EC Directives****Hazard Symbols:**

T N

**Risk Phrases:**

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R 40 Limited evidence of a carcinogenic effect.

R 48/23/24 Toxic : danger of serious damage to health by prolonged exposure through inhalation and in contact with skin.

R 62 Possible risk of impaired fertility.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Safety Phrases:**

S 36/37 Wear suitable protective clothing and gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

S 61 Avoid release to the environment. Refer to special instructions

/safety data sheets.

**WGK (Water Danger/Protection)**

CAS# 98-95-3: 2

**Canada - DSL/NDSL**

CAS# 98-95-3 is listed on Canada's DSL List.

**Canada - WHMIS**

This product has a WHMIS classification of B3, D1A, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

**Canadian Ingredient Disclosure List**

CAS# 98-95-3 is listed on the Canadian Ingredient Disclosure List.

