

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
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Phillipsburg, NJ 08865

Mallinckrodt
CHEMICALS



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

NITROBENZENE

MSDS Number: N4530 --- Effective Date: 09/14/00

1. Product Identification

Synonyms: Nitrobenzol; benzene, nitro-; oil of mirbane; essence of mirbane

CAS No.: 98-95-3

Molecular Weight: 123.11

Chemical Formula: C₆H₅NO₂

Product Codes:

J.T. Baker: 9325, 9326

Mallinckrodt: 6404, 6410

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Nitrobenzene	98-95-3	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE METHEMOGLOBINEMIA. AFFECTS, BLOOD, LIVER, KIDNEYS, AND REPRODUCTIVE SYSTEM. CAUSES IRRITATION TO EYES AND SKIN. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. COMBUSTIBLE LIQUID AND VAPOR.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life)
Flammability Rating: 2 - Moderate
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe (Life)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES;
CLASS B EXTINGUISHER
Storage Color Code: Red (Flammable)

Potential Health Effects

This material is so dangerous that personnel handling it should be trained to recognize the symptoms of methemoglobinemia.

Inhalation:

May be absorbed through inhalation of vapors. Symptoms parallel those following ingestion exposure.

Ingestion:

May cause headache, shallow respiration, dizziness, vomiting, weakness, and blood pressure fall. Forms methemoglobin in the blood, reducing oxygen transport and producing cyanosis, and anemia. Convulsions, coma and death may follow. Symptoms may be delayed from 1 to 4 hours, and workers developing fatal cases of methemoglobinemia may not immediately feel sick. Because of bitter almond odor, cyanide poisoning may be suspected, but cyanide acts much faster. Poisoning closely resembles that due to aniline. Estimated lethal dose 1 to 5 grams.

Skin Contact:

May be irritating and sensitizing to the skin. May be rapidly absorbed through the skin, with symptoms paralleling those following ingestion exposure.

Eye Contact:

Vapors cause eye irritation. Splashes cause severe irritation, possible corneal burns and eye damage.

Chronic Exposure:

Repeated or prolonged exposure through any route may cause damage to the central nervous system, liver, spleen, kidneys, and bone marrow. May also cause weight loss, anemia, jaundice, hemolysis, weakness, and irritability. A two year study titled "A Chronic Inhalation Toxicity Study of Nitrobenzene in B6CF1 Mice, Fischer 344 Rats and Sprague-Dawley Rats", was released by the Chemical Industry Institute of Toxicology (CIIT). The report indicates that Nitrobenzene has weak carcinogenic activity in rodents after chronic inhalation exposure and may express carcinogenic activity in humans. Based upon the result of this animal testing, Nitrobenzene should be handled as a potential carcinogen.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin or blood disorders or impaired liver, kidney, or cardiovascular function may be more susceptible to the effects of this substance. The influence of ethyl alcohol may aggravate the toxic effects of nitrobenzene.

4. First Aid Measures

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do not give mouth to mouth resuscitation. CALL A PHYSICIAN IMMEDIATELY.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician immediately. Thorough cleansing of the entire contaminated area of the body including scalp and nails is of the utmost importance.

Eye Contact:

Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper

eyelids occasionally. Call a physician immediately.

Note to Physician:

Consider methylene blue as an antidote.

5. Fire Fighting Measures

Fire:

Flash point: 88C (190F) CC

Autoignition temperature: 482C (900F)

Flammable limits in air % by volume:

l_{el}: 1.8

(l_{el} @ 93C)

Explosion:

Above the flash point, explosive vapor-air mixtures may be formed. Contact with strong oxidizers may cause fire. Vapors can flow along surfaces to distant ignition source and flash back. Forms explosive mixtures with aluminum chloride, aniline plus glycerine, nitric acid, nitrogen tetroxide, aromatic nitrogen compounds, urea perchlorate, sodium hydroxide, sulfuric acid, potassium, potassium/sodium alloys, and silver perchlorate.

Fire Extinguishing Media:

Water spray, dry chemical, alcohol foam, or carbon dioxide. Use water spray to blanket fire, cool fire exposed containers, and to flush non-ignited spills or vapors away from fire.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Separate from incompatibilities. Workers must carefully follow good hygienic practices, including no eating, drinking, or smoking in workplace. Proper use and maintenance of protective equipment is essential. Workers using this substance need preplacement and annual medical exams. Special training should be given to workers. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

Nitrobenzene:

-OSHA Permissible Exposure Limit (PEL): 1 ppm (TWA) skin

-ACGIH Threshold Limit Value (TLV): 1 ppm (TWA) skin, A3- Confirmed Animal Carcinogen with Unknown Relevance to Humans.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a half-face organic vapor respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Pale yellow to brown, oily liquid.

Odor:

Almond odor.

Solubility:

Practically insoluble in water.

Specific Gravity:

1.20 @ 20C/4C

pH:

No information found.

% Volatiles by volume @ 21C (70F):

No information found.

Boiling Point:

211C (412F)

Melting Point:

5.7C (43F)

Vapor Density (Air=1):

4.3

Vapor Pressure (mm Hg):

1.0 @ 44.4C (111F)

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Due to low electric conductivity, the substance can generate electrostatic charges as a result of flow, agitation, etc.

Hazardous Decomposition Products:

Burning may produce carbon monoxide, carbon dioxide, nitrogen oxides.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Reducing agents, oxidizing agents, aluminum chloride, aniline plus glycerine, nitric acid, nitrogen tetroxide, silver perchlorate, potassium, potassium/sodium alloys, aromatic nitrogen compounds, sodium hydroxide, sulfuric acid, tin, and zinc.

Conditions to Avoid:

Heat, flame, ignition sources, freezing, incompatibles

11. Toxicological Information

Toxicological Data:

Oral rat LD50: 780 mg/kg; skin rat LD50: 2100 mg/kg; investigated as a mutagen, reproductive effector.

Reproductive Toxicity:

In laboratory animals, this compound has caused both birth defects and damage to the reproductive system.

Carcinogenicity:

A two year study titled "A Chronic Inhalation Toxicity Study of Nitrobenzene in B6CF1 Mice, Fischer 344 Rats and Sprague-Dawley Rats", was released by the Chemical Industry Institute of Toxicology (CIIT). The report indicates that Nitrobenzene has weak carcinogenic activity in rodents after chronic inhalation exposure and may express carcinogenic activity in humans. Based upon the result of this animal testing, Nitrobenzene should be handled as a potential carcinogen.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Nitrobenzene (98-95-3)	No	No	2B

12. Ecological Information

Environmental Fate:

When released into the soil, this material may leach into groundwater. When released into water, this material may evaporate to a moderate extent. When released into water, this material is expected to readily biodegrade. When released into the water, this material is expected to have a half-life between 1 and 10 days. This material has an experimentally-determined bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by photolysis. When released into the air, this material is expected to have a half-life of less than 1 day.

Environmental Toxicity:

The EC50/48-hour values for daphnia are between 10 and 100 mg/l. The LC50/96-hour values for fish are over 100 mg/l. This material may be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination

of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: NITROBENZENE
Hazard Class: 6.1
UN/NA: UN1662
Packing Group: II
Information reported for product/size: 4L

International (Water, I.M.O.)

Proper Shipping Name: NITROBENZENE
Hazard Class: 6.1
UN/NA: UN1662
Packing Group: II
Information reported for product/size: 4L

International (Air, I.C.A.O.)

Proper Shipping Name: NITROBENZENE
Hazard Class: 6.1
UN/NA: UN1662
Packing Group: II
Information reported for product/size: 4L

15. Regulatory Information

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-----\Chemical Inventory Status - Part 1\-----
Ingredient                TSCA  EC   Japan  Australia
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Nitrobenzene (98-95-3)    Yes   Yes  Yes    Yes
    
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-----\Chemical Inventory Status - Part 2\-----
Ingredient                Korea  DSL  NDSL  Phil.
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Nitrobenzene (98-95-3)    Yes   Yes  No    Yes
    
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-----\Federal, State & International Regulations - Part 1\-----
Ingredient                -SARA 302-  -SARA 313-
                        RQ   TPQ   List  Chemical Catg.
-----
Nitrobenzene (98-95-3)    1000  10000  Yes   No
    
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-----\Federal, State & International Regulations - Part 2\-----
Ingredient                CERCLA  -RCRA-  -TSCA-
                        261.33  8(d)
-----
Nitrobenzene (98-95-3)    1000    U169    No
    
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Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
 Reactivity: No (Pure / Liquid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: 2X

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 2 Reactivity: 1

Label Hazard Warning:

DANGER! MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE METHEMOGLOBINEMIA. AFFECTS, BLOOD, LIVER, KIDNEYS, AND REPRODUCTIVE SYSTEM. CAUSES IRRITATION TO EYES AND SKIN. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. COMBUSTIBLE LIQUID AND VAPOR.

Label Precautions:

Do not breathe vapor.
 Do not get in eyes, on skin, or on clothing.
 Keep container closed.
 Use only with adequate ventilation.
 Wash thoroughly after handling.
 Keep away from heat and flame.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. IF INHALED, remove to fresh air. If not breathing, give artificial respiration. DO NOT GIVE MOUTH-TO-MOUTH RESUSCITATION. If breathing is difficult, give oxygen. Keep patient warm and at rest. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician immediately.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 8.

Disclaimer:

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