

SAFETY DATA SHEETS

According to the UN GHS revision 10

1: Identification

1.1 GHS Product identifier

Product name Nitrobenzene

1.2 Other means of identification

Product number 98-95-3

Other names Nitrobenzene

1.3 Recommended use of the chemical and restrictions on use

Identified uses Industrial and scientific research use.

Uses advised against no data available

1.4 Supplier's details

Company Zhongshan Greenrock Technology Co., Ltd.

Address No. 138, Jinsan Avenue, Sanjiao Town, Zhongshan City, Guangdong Province, China

Telephone +86-2087066781

1.5 Emergency phone number

Emergency phone number +86-2087066781

Service hours Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

2: Hazard identification

2.1 Emergency Overview

Highly toxic substances, even small amounts of which can cause death or serious health effects. They can enter the body through inhalation, skin contact, or ingestion. Immediate protective measures must be taken to avoid any contact.

2.2 GHS Classification

Acute toxicity, oral; acute toxicity, dermal; acute toxicity, inhalation : Category 3

Acute toxicity, oral : Category 3

Acute toxicity, dermal : Category 3

Acute toxicity, inhalation : Category 3

Specific target organ toxicity, single exposure; Narcotic effects : Category 3

Carcinogenicity : Category 2

Reproductive toxicity : Category 1, 1A, 1B

Reproductive toxicity : Category 2

Specific target organ toxicity, repeated exposure : Category 1
Hazardous to the aquatic environment, long-term hazard : Category 2
Hazardous to the aquatic environment, long-term hazard : Category 3

2.3 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled
H301 Toxic if swallowed
H311 Toxic in contact with skin
H331 Toxic if inhaled
H336 May cause drowsiness or dizziness
H351 Suspected of causing cancer
H360 May damage fertility or the unborn child
H361 Suspected of damaging fertility or the unborn child
H372 Causes damage to organs through prolonged or repeated exposure
H411 Toxic to aquatic life with long lasting effects
H412 Harmful to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P203 Obtain, read and follow all safety instructions before use.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P262 Do not get in eyes, on skin, or on clothing.
P264 Wash hands [and ...] thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

Response

P316 Get emergency medical help immediately.
P318 if exposed or concerned, get medical advice.
P319 Get medical help if you feel unwell.
P321 Specific treatment (see ... on this label).
P330 Rinse mouth.
P391 Collect spillage.
P301+P316 IF SWALLOWED, Get emergency medical help immediately.
P302+P352 IF ON SKIN, wash with plenty of water/...
P304+P340 IF INHALED, Remove person to fresh air and keep comfortable for breathing.
P361+P364 Take off immediately all contaminated clothing and wash it before reuse.

Storage

P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501 Dispose of contents/container to ...

2.4 Physical and chemical

Some substances may also be flammable or corrosive. Mixing with other substances may produce toxic products. Highly volatile substances can form toxic vapor clouds, expanding the hazard range.

2.5 Health hazards

Acute toxicity, May cause respiratory failure, cardiac arrest, nervous system depression, or organ failure. Severe symptoms may appear within a short period of exposure (minutes to hours). Long-term effects may include permanent organ damage.

2.6 Environmental hazards

It is extremely toxic to aquatic organisms and terrestrial ecosystems, and even a small release can cause large-scale biological mortality. It may persist in the environment and accumulate through the food chain, causing long-term damage to ecosystems.

2.7 Other hazards which do not result in classification

no data available

3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Nitrobenzene	Nitrobenzene	98-95-3	202-716-0	99%

4: First-aid measures

4.1 General advice

Stop contact immediately and move to a safe area; bring the material SDS document and call emergency services immediately; record the route of exposure (inhalation/skin/ingestion), exposure time and dosage for the doctor's judgment.

4.2 If inhaled

Quickly transfer the patient to a place with fresh air, keep the patient lying flat with the head tilted to one side (to prevent suffocation by vomitus); if cyanosis or breathing difficulties occur, immediately give oxygen (flow rate 5-10L/min); it is strictly forbidden to feed/drink water to the unconscious person, and seek medical attention immediately.

4.3 In case of skin contact

Immediately remove contaminated clothing (if clothing is stuck to the skin, cut it with scissors to avoid tearing it). Rinse the affected area with plenty of running water for 20-30 minutes (the water temperature should be around 37°C, avoiding excessive heat or cold). If the skin is damaged, cover it with sterile gauze after rinsing. Do not apply ointment.

4.4 In case of eye contact

Immediately flush with an eyewash station for 15 minutes (open the eyelids to ensure thorough flushing of the upper and lower fornixes); wear a light-shielding eye mask after flushing to avoid strong light

stimulation, and immediately seek medical attention from an ophthalmologist (bring along the substance SDS).

4.5 If swallowed

Self-induced vomiting is strictly prohibited (especially with corrosive and toxic substances, which may cause secondary burns to the esophagus). If the patient is conscious and not convulsing, they can drink 50-100ml of milk under the guidance of a doctor (to protect the gastric mucosa).

4.6 Most important symptoms and effects, both acute and delayed

Acute symptoms: nausea and vomiting, abdominal pain, dyspnea, convulsions, confusion, and decreased blood pressure; delayed symptoms: liver and kidney damage (appearing within 24-72 hours), methemoglobinemia (such as nitrite poisoning).

4.7 Protection of first-aiders

Rescuers must wear fully enclosed chemical protective clothing, a gas mask (with a targeted gas filter cartridge, such as for organic vapors and acid gases), and chemical protective gloves; avoid direct contact with the patient's vomitus/secretions, and wash hands immediately with chlorine-containing disinfectant after contact.

4.8 Notes to physician

Inform the physician of the substance's toxicity (e.g., oral LD50 = 5 mg/kg) and route of exposure; prioritize gastric lavage (physician evaluation required for appropriateness) and administer antidotes (e.g., atropine for organophosphate poisoning); monitor liver and kidney function, electrolytes, and coagulation function.

5: Fire-fighting measures

5.1 Unsuitable extinguishing media

It is strictly forbidden to use fire extinguishing agents that may cause the spread of toxic substances (such as high-pressure water jets); if flammable liquids are involved, avoid using carbon dioxide (which may cause toxic vapor condensation).

5.2 Specific hazards during fire fighting

Combustion may be accompanied by the release of highly toxic substances (such as cyanide and arsenide), which are fatal by inhalation or skin contact; the combustion of flammable components can easily cause explosions and intensify the spread of toxic substances; toxic vapors are heavier than air and tend to accumulate in low-lying areas.

5.3 Hazardous combustion products

Highly toxic gases (such as hydrogen chloride, hydrogen fluoride, phosgene), carbon monoxide, nitrogen oxides; some contain heavy metal components that release toxic fumes such as mercury and lead.

5.4 Specific extinguishing methods

For small areas: use dry powder fire extinguishing agent to extinguish the fire, and dilute the toxic vapor with mist water (avoid direct spraying); for large areas: give priority to evacuation. If fire extinguishing is necessary, set up a fire extinguishing point upwind and cover it with foam (to isolate oxygen); after

extinguishing the fire, test the area for toxicity concentration (entry is allowed only when the value is below MAC).

5.5 Special protective equipment for fire-fighters

Wear fully enclosed chemical protective clothing, gas masks (with targeted gas filter boxes, such as organic vapor + acidic gas), and chemical protective gloves (made of fluororubber); carry a portable toxic gas detector; equipment must be disinfected after the operation, and personnel must undergo health monitoring.

6: Accidental release measures

6.1 Protective measures for workers

Wear fully enclosed chemical protective clothing, positive pressure air respirator, chemical protective gloves (toxic-resistant type) and goggles; avoid direct contact with the skin and wash immediately after work.

6.2 Environmental protection measure

Isolate the 30-meter contaminated area to prevent the leak from spreading through rainwater/groundwater; take samples of water/soil for testing, and use activated carbon adsorption (organic poison) or neutralizer (inorganic poison) for treatment when exceeding the standard; strictly prohibit the leak from entering the drinking water source.

6.3 Containment methods for leaked chemicals

Collect liquids in corrosion-resistant sealed containers (marked with "toxic substances"); collect solids in chemical-resistant bags (to avoid dust); and store them separately in a hazardous waste warehouse after collection, away from food/feed.

6.4 Cleanup methods for chemical spills

Small leakage: absorb with special absorbent cotton (toxic-resistant) and put into chemical-proof bag; large leakage: professionals use chemical-proof pump to transfer to special storage tank; after cleaning, treat the ground with neutralizer (weak base for acid poison and weak acid for alkali poison).

6.5 Measures to prevent the spread of leaks

Set up a 30-meter isolation zone and prohibit unauthorized personnel from entering; volatile toxic substances require explosion-proof ventilation to reduce gas concentration; use chemical defense isolation belts to block them, and focus on monitoring low-lying areas (to prevent the accumulation of toxic substances).

6.6 Container leakage treatment

Minor leaks: Seal with compatible sealant; Serious leaks: Evacuate immediately, close the upstream valve (if safe), and have the toxic material disposal team handle it. It is strictly forbidden to open the container without authorization.

6.7 Special considerations

Workers must receive poisoning first aid training and carry antidotes (if applicable). In case of skin contact, flush immediately with plenty of water for 15 minutes. In case of inhalation poisoning, move immediately to fresh air and seek medical attention.

7: Handling and storage

7.1 Safe storage conditions

Store in a closed, impermeable dedicated warehouse (the walls are made of anti-corrosion materials, such as polyethylene coating); the container is made of corrosion-resistant material (such as polytetrafluoroethylene, glass-lined steel), with a double sealing cover (threaded cover + nitrile rubber sealing ring); the warehouse is equipped with a negative pressure ventilation system (air changes ? 8 times/hour), and the exhaust gas must be treated with activated carbon adsorption (adsorption efficiency ? 95%).

7.2 Storage precautions

Store them separately from food, feed, and medicine (isolation distance ? 3 meters), and strictly prohibit them from being adjacent to drinking water sources; clearly mark "highly toxic" and H code on container labels and store them separately on locked shelves; check the sealing of containers weekly and immediately transfer them to the emergency treatment area if any leakage is found; workers must wear fully enclosed chemical protective clothing before entering the warehouse.

7.3 VCI Storage Grade

Level 1 (highest): The inner wall of the metal container is coated with a VCI anti-rust coating (thickness ? 50?m), and the outer surface of the container is wrapped with a vapor phase anti-rust film; the concentration of toxic substances in the warehouse is tested monthly to ensure that it is lower than the MAC value (for example, MAC of oral toxic substances ? 0.1mg/m³).

7.4 Recommended storage temperature

10-30?, avoid extreme temperatures (below 0? or above 35?); volatile toxic substances must be kept at a temperature ?25? to reduce vapor release; refrigerated storage substances (such as certain biotoxins) must be maintained at 2-8? and equipped with dual power supply protection (if the label has a recommended storage temperature, the label shall prevail).

7.5 Handling

For precautions see Safety Data Sheet section 2

Advice on safe handling : Work under hood. Do not inhale substance/mixture.

8: Exposure controls/personal protection

8.1 Respiratory protection

Choose according to the exposure route: volatile substances require positive pressure air respirators; dust/aerosols require powered air-purifying respirators to ensure the protection factor (APF) ? 1000.

8.2 Recommended Filter type

For organic toxic substances, choose Type A filter cartridge (to protect against organic vapors, such as benzene and methanol); for inorganic toxic substances, choose Type B (to protect against ammonia) or Type E (to protect against acidic gases, such as hydrogen chloride); for dust, add Type P3 filter cotton.

8.3 Eye/face protection

Wear a full-face chemical protective mask. The mask material must be resistant to toxic penetration (such as fluororubber), and the lens must be anti-fog and anti-chemical corrosion.

8.4 Skin and body protection

Wear fully enclosed chemical protective clothing. The material must be compatible with toxic substances (such as polyethylene + neoprene composite material); the cuffs and ankles must be tightened and equipped with emergency escape zippers.

8.5 Hand protection

Wear toxic and chemical-resistant gloves, preferably made of fluororubber or butyl rubber, with a length of 30 cm, covering the forearm, and change every 4 hours

8.6 Hygiene measures

Immediately after the operation, clean the skin with a special detergent (such as a weak alkaline detergent), and then rinse with running water for 15 minutes; clothes need to be disinfected at high temperature (above 60°C) before washing; regular physical examinations (blood routine, liver and kidney function tests every 3 months).

9: Physical and chemical properties and safety characteristics

Physical state	yellow liquid
Colour	Greenish-yellow crystals or yellow, oily liquid
Odour	Odor of volatile oil almond
Melting point/freezing point	41765oC
Boiling point or initial boiling point and boiling range	210-211°C(lit.)
Flammability	Class IIIA Combustible Liquid: Fl.P. at or above 60°C and below 93.33°C.Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit	Lower flammable limit: 1.8% by volume at 200 def F (93°C)
Flash point	88°C
Auto-ignition temperature	481.67°C
Decomposition temperature	When heated to decomposition it emits toxic fumes of /nitrogen oxides/.
pH	no data available
Kinematic viscosity	1.863 mPa-s at 25°C
Solubility	In water:slightly soluble

Partition coefficient n-octanol/water	log Kow = 1.85
Vapour pressure	0.15 mm Hg (20 °C)
Density and/or relative density	1.196g/mL at 25°C(lit.)
Relative vapour density	4.2 (vs air)
Particle characteristics	no data available

10: Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

/Fire hazard is/ moderate when exposed to heat, flame, or oxidizers. Aluminum chloride added to NITROBENZENE containing about 5% phenol caused a violent explosion [Chem. Eng. News 31:4915. 1953]. Heating a mixture of nitrobenzene, flake sodium hydroxide and a little water led to an explosion, discussed in [Bretherick's 5th ed. 1995]. Mixed with oxidants, i.e. dinitrogen tetraoxide, fluorodinitromethane, nitric acid, peroxodisulfuric acid, sodium chlorate, tetranitromethane, uranium perchlorate, etc., forms highly sensitive explosive, [Bretherick 5th ed, 1995]. Heated mixtures of nitrobenzene and tin(IV) chloride produce exothermic decomposition with gas production [Bretherick, 5th Ed., 1995].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Explosive reaction with solid or concentrated alkali + heat (eg, sodium hydroxide or potassium hydroxide), aluminum chloride + phenol (at 120°C), aniline + glycerol + sulfuric acid, nitric + sulfuric acid + heat.

10.6 Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /nitrogen oxides/.

11: Toxicological information

11.1 Acute toxicity

Oral: LD50 Rat oral 600 mg/kg

Inhalation: no data available

Dermal: no data available

11.2 Skin corrosion/irritation

no data available

11.3 Serious eye damage/irritation

no data available

11.4 Respiratory or skin sensitization

no data available

11.5 Germ cell mutagenicity

no data available

11.6 Carcinogenicity

NTP: Reasonably anticipated to be a human carcinogen

11.7 Reproductive toxicity

No information is available on the reproductive or developmental effects of nitrobenzene in humans. Developmental effects, such as birth defects or embryotoxic effects, have not been reported in animal studies with inhalation exposure to nitrobenzene. However, reproductive effects, including a decrease in fertility, reduced testicular weights, and decreased sperm production have been noted in inhalation and oral animal studies.

11.8 STOT-single exposure

no data available

11.9 STOT-repeated exposure

no data available

11.10 Aspiration hazard

no data available

12: Ecological information

12.1 Toxicity

Toxicity to fish: LC50; Species: Brachydanio rerio (Zebra fish); Concentration: 113 mg/L for 4 days; Conditions: pH 7.5

Toxicity to daphnia and other aquatic invertebrates: EC50; Species: Daphnia magna (Water flea, age <24 hr); Conditions: freshwater, static, 20°C, pH 8.2, hardness 130 mg/L CaCO₃; Concentration: 11500 ug/L for 24 hr (95% confidence interval: 8800-15000 ug/L); Effect: intoxication, immobilization

Toxicity to algae: EC50; Species: Pseudokirchneriella subcapitata (Green algae, age 3-7 days); Conditions: freshwater, static, 24°C, pH 7.3-9.77; Concentration: 20790 ug/L for 96 hr (95% confidence interval: 3450-38130 ug/L); Effect: decreased population biomass
Toxicity to microorganisms: no data available

12.2 Persistence and degradability

NITROBENZENE WAS DEGRADED BY ACTIVATED SLUDGE IN MUNICIPAL WASTEWATER AT CONCN OF 400-600 G/CU M. ACTIVATED SLUDGE ADAPTED TO DEGRADATION OF HIGH PYRIDINE CONCN IS ALSO ABLE TO DECOMPOSE NITROBENZENE.

12.3 Bioaccumulative potential

The BCF of nitrobenzene in golden orfe (*Leuciscus idus melanotus*) was <10 in a 3 day static test(1). In a 28 day flow through test using fathead minnows, the BCF was 15(2). Another investigator obtained a BCF of 6 in fish (*Poecilia reticulata*)(3) and the bioconcentration test of the Japanese Ministry of International Trade and Industry report a BCF of <10(4). A BCF of 3.31 was also reported in unspecified fish(5). No biomagnification of nitrobenzene was observed in an aquatic ecosystem containing algae, daphnia magna, mosquito larvae, snails, and mosquito fish(6). BCF values of 3.1-4.8 and 1.6-7.7 were measured in carp (*Cyprinus carpio*) at concentrations of 0.125 and 0.0125 mg/L nitrobenzene, respectively, in a 6 week flow through test(7). In a 3 day static test using guppies, a BCF value of 2.4 was measured(8). Nitrobenzene had an uptake efficiency (defined as the ratio of the flux of chemical into the fish to the flux of chemical into the gill compartment) of 0.26 in rainbow trout(9). Nitrobenzene had a lipid based BCF of 28.32 in carp(10). A BCF of 1.47 was determined for goldfish (*Carassius auratus*)(11). In green algae (*Chlorella fusca*), a BCF of 24 was obtained(1). According to a classification scheme(12), these BCFs suggest bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil

The leachability of nitrobenzene was studied in three typical Norwegian soils, one which was sandy with a low organic content, and two organic soils(1). The resulting Koc and retardation factor for the sandy soil were 30.6 and 1.27, while for the two organic soils the Koc values were 42.8 and 69.6 and the retardation factors 3.36 and 5.52(1). Koc values for two Danish subsoils were 170 and 370(2). When a mixture of pollutants, including nitrobenzene, in spring water was added to a column of Lincoln fine sand over a 45 day period, the retardation factor of nitrobenzene was 1.9(3). The Koc calculated from this experiment was 200(3). The sorption of nitrobenzene on two soils, a Captina silt loam (pH 4.97; 1.49% organic carbon) and a McLaurin sandy loam (pH 4.43; 0.66% organic carbon) was measured in the presence of a mixture of 16 organic chemicals; Koc values for nitrobenzene of 89 and 105.6 were measured for the Captina and McLaurin soils, respectively(4). Koc values of 89 and 100 were measured in river sediment (6.5-16.9% organic matter) and coal wastewater pond sediment (52% organic matter), respectively(5). Other reported Koc values for nitrobenzene were 158(6), 36(7), 156(8), 100(9), 62-74 to particulate organic matter and 34-38 to dissolved organic matter(10). According to a classification scheme(11), these measured Koc values suggest that nitrobenzene has very high to moderate mobility in soil(SRC).

12.5 Other adverse effects

no data available

13: Disposal considerations

13.1 Disposal methods for waste chemicals

This must be handled by a qualified unit that handles highly toxic waste, using high-temperature incineration (800-1000°C) or chemical neutralization (such as oxidative decomposition) to completely destroy the toxicity. Liquid highly toxic substances must be solidified before incineration. Those that cannot be incinerated must be stabilized/solidified before being safely landfilled.

13.2 Precautions

Disposal personnel must wear fully enclosed chemical protective suits and positive pressure respirators; waste must be strictly classified and packaged to prevent leakage; exhaust gas and wastewater generated during the disposal process must meet discharge standards; mixing with other types of waste is prohibited; and disposal records must be kept for at least 10 years for traceability.

14: Transport information

14.1 UN Number

ADR/RID: UN1662

IMDG: UN1662

IATA: UN1662

14.2 UN Proper Shipping Name

ADR/RID: NITROBENZENE

IMDG: NITROBENZENE

IATA: NITROBENZENE

14.3 Transport hazard class(es)

ADR/RID: 6.1

IMDG: 6.1

IATA: 6.1

14.4 Packing group, if applicable

ADR/RID: II

IMDG: II

IATA: II

14.5 Environmental hazards

ADR/RID: no

IMDG: no

IATA: no

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Nitrobenzene	Nitrobenzene	98-95-3	202-716-0
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.

Vietnam National Chemical Inventory	Listed.
Australian Inventory of Industrial Chemicals (AIIC)	Not Listed.
Catalogue of Strictly Restricted Toxic Chemicals in China	Not Listed.
China Catalog of Hazardous chemicals 2015	Listed.
European INventory of Existing Commercial chemical Substances	Not Listed.
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans	Listed.
TSCA Inventory of Chemical Substances	Listed.

16: Other information

Information on revision

SDS Creation Date July 1, 2025

SDS Revision Date July 1, 2025

Abbreviations and acronyms in SDS

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

SDS References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Any questions regarding this Safety Data Sheet, Please send your inquiry to sales@MolBest.com

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our

knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.