

SAFETY DATA SHEETS

According to the UN GHS revision 10

1: Identification

1.1 GHS Product identifier

Product name 4-Nitroaniline

1.2 Other means of identification

Product number 100-01-6

Other names 4-Nitroaniline

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 Visit molwiki.com to edit online and customize the content.

Address Visit molwiki.com to edit online and customize the content.

Telephone Visit molwiki.com to edit online and customize the content.

1.5 Emergency phone number

Emergency phone number Visit molwiki.com to edit online and customize the content.

Service hours Visit molwiki.com to edit online and customize the content.

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, repeated exposure : 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
H373 May cause damage to organs through prolonged or repeated exposure
H412 Harmful to aquatic life with long lasting effects

Precautionary statement(s)**Prevention**

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.
P319 Get medical help if you feel unwell.
P321 Specific treatment (see ... on this label).
P330 Rinse mouth.
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.

Disposal

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

3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
4-Nitroaniline	4-Nitroaniline	100-01-6	202-810-1	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 solid with a mild odor
Colour	Pale yellow monoclinic crystals from water
Odour	Faint ammonia; slightly pungent
Melting point/freezing point	147-151°C
Boiling point or initial boiling point and boiling range	260°C/100mmHg(lit.)
Flammability	Combustible SolidCombustible. Many reactions may cause fire or explosion.
Lower and upper explosion limit/flammability limit	no data available
Flash point	213°C
Auto-ignition temperature	180°C
Decomposition temperature	When heated to decomp it emits toxic /nitrogen oxides./
pH	pH = 6.7
Kinematic viscosity	no data available
Solubility	In water:0.8 g/L (20 °C)
Partition coefficient n-octanol/water	log Kow = 1.39
Vapour pressure	0mmHg at 25°C
Density and/or relative density	1.437
Relative vapour density	4.77 (Relative to Air)

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

Combustible when exposed to heat or flame. Dust explosion possible if in powder or granular form, mixed with air. P-NITROANILINE may react vigorously with sulfuric acid above 200°C. It may also react with sodium hydroxide at 130°C. Under pressure, it may produce an explosive compound. It is incompatible with strong oxidizers and strong reducing agents. It is capable of explosive decomposition with strong initiators. It will attack some forms of plastics, rubber and coatings.

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

An ammoniacal soln of 4-nitroaniline containing ammonium chloride was being treated with 50% sodium hydroxide soln to displace ammonia. In error, double the amt required to give usual 10% of free alkali was added, & during subsequent degassing operation (heating to 130°C under pressure, followed by depressuring to vent ammonia), complete conversion to sodium 4-nitrophenoxide occurred. ... /When/ separated by centrifuging, it was then heated to dry ... when it decomposed violently & was ejected through the vessel opening. ... Some of the tautomeric aci-nitroquinonoid salt may have been produced during the drying operation.

10.6 Hazardous decomposition products

Explosive decomposition may occur under fire conditions.

11: Toxicological information

11.1 Acute toxicity

Oral: LD50 Guinea pig oral 450 mg/kg bw

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

A4; Not classifiable as a human carcinogen.

11.7 Reproductive toxicity

no data available

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: Danio rerio (Zebra danio, age 3 months, weight 200-350 mg); Conditions: freshwater, renewal, 26.5°C, pH 8.6, dissolved oxygen 85%; Concentration: 908 µmol/L for 96 hr

Toxicity to daphnia and other aquatic invertebrates: LC50; Species: Daphnia magna (Water flea age < or =24 hr); Conditions: freshwater, static, 20-22°C, pH 7.6-7.7, hardness 16 dH; Concentration: 24 mg/L for 24 hr

Toxicity to algae: EC50 Chlorella vulgaris (Algae) 350.14 mg/L/6 hr; biomass.

Toxicity to microorganisms: no data available

12.2 Persistence and degradability

P-NITROANILINE AT CONCN 250-1000 MG/L WAS DEGRADED BY A MIXT OF PSEUDOMONAS FLUORESCENS & BACILLUS VALINOVORUS.

12.3 Bioaccumulative potential

In a 6-week bioconcentration test, the BCF of 4-nitroaniline was 2.9-3.6 at a concentration of 0.5 mg/L and <10 at a concentration of 0.05 mg/L(1). In a bioconcentration study using zebrafish and a 4-nitroaniline concentration of 0.21 µmol/L, the BCF was measured to be 4.4(2). According to a classification scheme(3), these experimental BCF values suggest bioconcentration in aquatic organisms is low (SRC).

12.4 Mobility in soil

4-Nitroaniline has measured log K_{oc} values of 1.78(1) and 1.88(2) and log K_{om} values of 1.49(3) and 1.64(4). These values correspond to K_{oc} values of 60, 76, 54 and 75, respectively. 4-Nitroaniline has also been observed to have a K_{oc} of 87(5). According to a classification scheme(6), these K_{oc} values suggest that 4-nitroaniline is expected to have high mobility in soil. 4-Nitroaniline was found to have a K_d value of 13.5 L/kg in homoionic K⁺ Montmorillonite type soil(7). However, anilines are expected to bind strongly to humus or organic matter in soils due to the high reactivity of the aromatic amino group(8,9), suggesting that mobility may be much lower in some soils(SRC). 4-Nitroaniline had small and scattered amounts of irreversible binding over a 20 hour experiment(10).

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: UN1661

IMDG: UN1661

IATA: UN1661

14.2 UN Proper Shipping Name

ADR/RID: NITROANILINES (o-, m-, p-), p-)
IMDG: NITROANILINES (o-, m-, p-)
IATA: NITROANILINES (o-, m-, p-)

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
4-Nitroaniline	4-Nitroaniline	100-01-6	202-810-1
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			Not 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 info@molwiki.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.