

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.2
Creation Date: July 15, 2019
Revision Date: August 08, 2025

SECTION 1: Identification

1.1 GHS Product identifier

Product name 4-Nitrotoluene

1.2 Other means of identification

Product number CCEM500419

Other names Benzene, 1-methyl-4-nitro-; Quinomeoxime; 4-nitroso-pheno

1.3 Recommended use of the chemical and restrictions on use

Identified uses For laboratory and Industrial use only.

Uses advised against no data available

1.4 Supplier's details

Company CATO Research Chemicals Inc.

Address 3/F,Building B,No.179 BASIGO, Guangpu Rd East,Huangpu Dist,Guangzhou

Telephone +86-20-81960175

1.5 Emergency phone number

Emergency phone number +86-20-81960175

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

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Acute toxicity - Category 3, Oral

Acute toxicity - Category 3, Dermal

Acute toxicity - Category 3, Inhalation

Specific target organ toxicity – repeated exposure, Category 2

Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 2

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

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

H411 Toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P271 Use only outdoors or in a well-ventilated area.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P273 Avoid release to the environment.

Response	P301+P316 IF SWALLOWED: Get emergency medical help immediately. P321 Specific treatment (see ... on this label). P330 Rinse mouth. P302+P352 IF ON SKIN: Wash with plenty of water/... P316 Get emergency medical help immediately. P361+P364 Take off immediately all contaminated clothing and wash it before reuse. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P319 Get medical help if you feel unwell. P391 Collect spillage.
Storage	P405 Store locked up. P403+P233 Store in a well-ventilated place. Keep container tightly closed.
Disposal	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
4-Nitrotoluene	4-nitrotoluene	99-99-0	202-808-0	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

Following skin contact

Rinse and then wash skin with water and soap. Refer for medical attention. Wear protective gloves when administering first aid.

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Refer for medical attention.

4.2 Most important symptoms/effects, acute and delayed

INHALATION, INGESTION, OR SKIN: Headache, flushed face, dizziness, dyspnea (difficult breathing), cyanosis, nausea, vomiting, muscular weakness, rapid pulse and respiration, irritability, and convulsions. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Aromatic hydrocarbons and related compounds

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Use dry chemical, carbon dioxide, or water spray. Water streams or foam may cause frothing. Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Extinguish fire using agent suitable for surrounding fire.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Yields toxic oxides of nitrogen when burning. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Use water spray, powder, foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. Carefully collect remainder. Then store and dispose of according to local regulations.

6.2 Environmental precautions

Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. Carefully collect remainder. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Ventilate area of spill or leak. For small quantities of liq nitrotoluene, absorb on paper towels. For small quantities of solid nitrotoluene, sweep onto paper or other suitable material. Remove to safe place (such as fume hood) & burn. Large quantities of liq nitrotoluene can be collected & atomized in suitable combustion chamber equipped with appropriate effluent gas cleaning device. Large quantities of solid nitrotoluene can be reclaimed; ... If not practical, dissolve in flammable solvent (such as alcohol) & atomize in suitable combustion chamber equipped with appropriate effluent gas cleaning device. Nitrotoluene

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames. NO contact with oxidizing agents. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Separated from food and feedstuffs. See Chemical Dangers. Well closed.Store in a cool, dry, well-ventilated location. Separate from acids, alkalis, oxidizing materials, and reducing agents.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 2 ppm as TWA; (skin); BEI issued.MAK: skin absorption (H); carcinogen category: 3B

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety goggles, face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Solid. Rhombic-bipyramidal crystals.
Colour	Colourless to light yellow.
Odour	Bitter almond
Melting point/freezing point	44.5 °C. Remarks:(unstable).;51.9 °C. Remarks:(stable).
Boiling point or initial boiling point and boiling range	238.3 °C. Atm. press.:101 kPa.;53.7 °C. Atm. press.:0.13 kPa.
Flammability	Combustible Solid
Lower and upper explosion limit/flammability limit	no data available
Flash point	103 °C. Atm. press.:1 013 hPa.
Auto-ignition temperature	450 °C.
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	1.2 mPa (= cP) at 60 deg C
Solubility	Insoluble in water
Partition coefficient n-octanol/water	log Pow = 2.37. Temperature:25 °C.
Vapour pressure	0.13 hPa. Temperature:20 °C.
Density and/or relative density	1.29. Temperature:20 °C.

Relative vapour density	4.7 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on heating. This produces toxic fumes of nitrogen oxides. Reacts violently with strong oxidants and sulfuric acid. This generates fire and explosion hazard. Attacks some forms of plastic, rubber and coatings.

10.2 Chemical stability

Heat contributes/ ... to instability. Nitrotoluene

10.3 Possibility of hazardous reactions

Combustible when exposed to heat or flame. P-NITROTOLUENE may react violently with sodium, tetranitromethane, strong oxidizing agents, sulfuric acid and other acids. (NTP, 1992)

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Decomposes on contact with strong oxidizers; strong acids; reducing agents; strong bases; ammonia, amines producing toxic fumes, causing fire and explosion hazard. Heat above 190 deg C may cause explosive decomposition. Attacks some plastics, rubbers, and coatings.

10.6 Hazardous decomposition products

The substance decomposes on heating producing toxic fumes /of/ (nitrogen oxides).

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 - rat (male/female) - > 2 250 mg/kg bw.
- Inhalation: LC50 - rat (male/female) - > 851 mg/m³ air.
- Dermal: LD50 - rat (male/female) - > 750 mg/kg bw.

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Evaluation: There is inadequate evidence in humans for the carcinogenicity of nitrotoluenes. There is inadequate evidence in experimental animals for the carcinogenicity of ... 4-nitrotoluene. ... Overall evaluation: Nitrotoluenes are not classifiable as to their carcinogenicity to humans (Group 3).

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the eyes. The substance may cause effects on the blood. This may result in the formation of methaemoglobin. The effects may be delayed. Medical observation is indicated.

STOT-repeated exposure

The substance may have effects on the blood, liver and testes.

Aspiration hazard

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed, especially if powdered.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 - Pimephales promelas - 49.7 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - ca. 4.2 mg/L - 48 h.
- Toxicity to algae: EC50 - Chlorella pyrenoidosa - 22 mg/L - 96 h.
- Toxicity to microorganisms: EC50 - other fungi: Phytium ultimum Trow. - ca. 30 mg/L - 88 h.

12.2 Persistence and degradability

AEROBIC: 4-Nitrotoluene, present at 100 mg/L, reached 0.8% of its theoretical BOD in 2 weeks using an activated sludge inoculum at 30 mg/L in the Japanese MITI test(1) which indicates the compound is not readily biodegradable(1). Two studies demonstrated that 4-nitrotoluene could be completely degraded by unacclimated sludge within two weeks when lower concentrations of 4-nitrotoluene (10 ppm) were used(2,3). When nitrotoluene-adapted activated sludges were used as an inoculum, however, 4-nitrotoluene was almost completely degraded (~98%) within 5 days, even when higher concentrations (200 mg/L) of 4-nitrotoluene were used(4). 2-Amino-4-methylphenol has been identified as a microbial degradation product of 4-nitrotoluene(5). Using a mixed culture isolated from a contaminated soil (near an ammunition plant), 4-nitrotoluene (at initial concentrations of 5 mg/L) degraded completely in 1 to 3 days in aerobic batch and continuous reactor tests(6).

12.3 Bioaccumulative potential

An estimated BCF of 13 was calculated for 4-nitrotoluene(SRC), using a log Kow of 2.37(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC). The BCF for 4-nitrotoluene has been measured to be low in an unidentified fish and in carp (*Carpinus carpio*)(4,5).

12.4 Mobility in soil

A log Koc value of 2.14 (Koc = 138) was experimentally determined for 4-nitrotoluene in a single lake sediment from China(1). Using a structure estimation method based on molecular connectivity indices(2), the Koc of 4-nitrotoluene can be estimated to be 363(SRC). According to a classification scheme(3), the estimated and experimental Koc values suggest that 4-nitrotoluene is expected to have high to moderate mobility in soil.

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN3446 (For reference only, please check.) IMDG: UN3446 (For reference only, please check.) IATA: UN3446 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: NITROTOLUENES, SOLID (For reference only, please check.) IMDG: NITROTOLUENES, SOLID (For reference only, please check.) IATA: NITROTOLUENES, SOLID (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.) IMDG: 6.1 (For reference only, please check.) IATA: 6.1 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: II (For reference only, please check.) IMDG: II (For reference only, please check.) IATA: II (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: Yes IMDG: Yes IATA: Yes

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 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-nitrotoluene	4-nitrotoluene	99-99-0	202-808-0
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.

EC Inventory	Listed.
United States Toxic Substances Control Act (TSCA) Inventory	Listed.
China Catalog of Hazardous chemicals 2015	Listed.
New Zealand Inventory of Chemicals (NZIoC)	Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.
Vietnam National Chemical Inventory	Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.
Korea Existing Chemicals List (KECL)	Listed.

SECTION 16: Other information

Information on revision

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Revision Date August 08, 2025

Abbreviations and acronyms

- 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%

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/>

Other Information

Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available. Depending on the degree of exposure, periodic medical examination is suggested.

Any questions regarding this SDS, Please send your inquiry to info@cato-chem.com

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