

## Chemical Safety Data Sheet MSDS / SDS

## 2-nitrotoluene SDS

Revision Date:2024-04-25 Revision Number:1

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**SECTION 1: Identification of the substance/mixture and of the company/undertaking****Product identifier**

Product name: 2-nitrotoluene

CAS: 88-72-2

**Relevant identified uses of the substance or mixture and uses advised against**

Relevant identified uses: For R&amp;D use only. Not for medicinal, household or other use.

Uses advised against: none

**Company Identification**

Company: Chemicalbook.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

Telephone: +91 9550333722

**SECTION 2: Hazards identification****Classification of the substance or mixture**

Acute toxicity - Category 4, Oral

Germ cell mutagenicity, Category 1B

Carcinogenicity, Category 1B  
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 2  
Reproductive toxicity, Category 2

### GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

### Hazard statement(s)

H302 Harmful if swallowed  
H340 May cause genetic defects  
H350 May cause cancer  
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.  
P203 Obtain, read and follow all safety instructions before use.  
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...  
P273 Avoid release to the environment.

#### Response

P301+P317 IF SWALLOWED: Get medical help.  
P330 Rinse mouth.  
P318 IF exposed or concerned, get medical advice.  
P391 Collect spillage.

#### Storage

P405 Store locked up.

#### 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.

#### Other hazards which do not result in classification

no data available

### SECTION 3: Composition/information on ingredients

#### Substance

Chemical name:	2-nitrotoluene
Common names and synonyms:	2-nitrotoluene
CAS number:	88-72-2
EC number:	201-853-3
Concentration:	100%

### SECTION 4: First aid measures

#### Description of necessary first-aid measures

##### If inhaled

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

##### Following skin contact

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

##### 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 .

#### Most important symptoms/effects, acute and delayed

INHALATION, INGESTION, OR SKIN: Headache, flushing of face, dizziness, dyspnea (difficult breathing), cyanosis, nausea, vomiting, muscular weakness, increased pulse and respiratory rate, irritability, and convulsions. SKIN: Irritation. (USCG, 1999)

### **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: Firefighting measures**

### **Suitable extinguishing media**

Water spray, fog, foam, CO<sub>2</sub>.

### **Specific hazards arising from the chemical**

Special Hazards of Combustion Products: Toxic fumes may be generated. Behavior in Fire: Generates toxic fumes. (USCG, 1999)

### **Special protective actions for fire-fighters**

Use water spray, powder, foam, carbon dioxide.

## **SECTION 6: Accidental release measures**

### **Personal precautions, protective equipment and emergency procedures**

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

### **Environmental precautions**

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

### **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

### Precautions for safe handling

NO open flames. NO contact with oxidizing agents. NO contact with incompatible materials: See Chemical Dangers 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.

### Conditions for safe storage, including any incompatibilities

Separated from food and feedstuffs. See Chemical Dangers. Well closed. Ventilation along the floor. Store in an area without drain or sewer access. Provision to contain effluent from fire extinguishing. Store in a cool, dry, well-ventilated location. Separate from acids, alkalis, oxidizing materials, and reducing agents.

## SECTION 8: Exposure controls/personal protection

### Control parameters

### Occupational Exposure limit values

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

### Biological limit values

no data available

### 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.

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

### Eye/face protection

Wear 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:	Liquid.
Colour:	Clear yellow.
Odour:	Weak, aromatic odor
Melting point/freezing point:	-9.3 °C.
Boiling point or initial boiling point and boiling range:	222 °C. Atm. press.:1 013 hPa.
Flammability:	Class IIIB Combustible Liquid: Fl.P. at or above 200°F.
Lower and upper explosion limit/flammability limit:	Lower 1.47%; Upper 8.8%
Flash point:	95 °C. Atm. press.:1 013 hPa.
Auto-ignition temperature:	420 °C.
Decomposition temperature:	no data available
pH:	no data available

Kinematic viscosity:	dynamic viscosity (in mPa s) = 2.37. Temperature:20°C.
Solubility:	Insoluble in water
Partition coefficient n-octanol/water:	log Pow = 2.3.
Vapour pressure:	0.16 hPa. Temperature:20 °C.
Density and/or relative density:	1.16 g/cm <sup>3</sup> . Temperature:20 °C.;1.12 g/cm <sup>3</sup> . Temperature:60 °C.
Relative vapour density:	4.72 (NTP, 1992) (Relative to Air)
Particle characteristics:	no data available

## SECTION 10: Stability and reactivity

### Reactivity

Decomposes on contact with strong oxidants, reducing agents, acids or bases. This produces toxic fumes. This generates fire and explosion hazard. Attacks some forms of plastic, rubber and coatings. On combustion, forms nitrogen oxides and carbon monoxide.

### Chemical stability

Heat contributes/ ... to instability. Nitrotoluene

### Possibility of hazardous reactions

Comustible when exposed to heat or open flame.O-NITROTOLUENE is toxic by inhalation, ingestion and skin absorption, targeting the blood, central nervous system, skin, and gastrointestinal tract. Symptoms include, anoxia, weakness or dizziness, nausea and vomiting. If it contacts the eye, the eye should be irrigated immediately. If it contacts the skin, the area should be washed with soap. If inhaled, respiratory support should be administered. Finally, if ingested, medical attention should be sought. It also reacts with sulfuric acid, sodium hydroxide, hydrogen, sodium, tetranitromethane, reducing agents and strong oxidizers. It is very heat sensitive.

### Conditions to avoid

no data available

### **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.

### **Hazardous decomposition products**

The substance decomposes ... /to/ form nitrogen oxides, carbon monoxide.

## **SECTION 11: Toxicological information**

### **Acute toxicity**

Oral: LD50 - rat (male/female) - ca. 2 100 mg/kg bw.

Inhalation: LC50 - rat (male) - > 1.086 mg/L air.

Dermal: no data available

### **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 limited evidence in experimental animals for the carcinogenicity of 2-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 liver, blood and testes. This substance is probably carcinogenic to humans. May cause heritable genetic damage to human germ cells. Animal tests show that this substance possibly causes toxic effects upon human reproduction.

#### **Aspiration hazard**

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

## **SECTION 12: Ecological information**

#### **Toxicity**

Toxicity to fish: LC50 - Danio rerio (previous name: Brachydanio rerio) - 40 mg/L - 7 d.

Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - 5.4 mg/L - 48 h.

Toxicity to algae: EC50 - Chlorella pyrenoidosa - 22 mg/L - 72 h.

Toxicity to microorganisms: toxic threshold (EC5) - Entosiphon sulcatum - 46 mg/L - 72 h.

#### **Persistence and degradability**

AEROBIC: 2-Nitrotoluene, present at 100 mg/L, reached 0.5% of its theoretical BOD in 2 weeks using an activated sludge inoculum at 30 mg/L in the Japanese Ministry of Industry and Trade (MITI) test that employs a mixed inoculum obtained from freshwater, soil, and sludge(1). Other evidence supports complete aerobic degradation of 10 mg/L 2-nitrotoluene within 2 weeks when incubated in adapted aerobic composite river sediment and sewage sludges(3). When nitrotoluene-adapted activated sludges were used as an inoculum, however, 2-nitrotoluene (200 mg/L) was almost completely degraded (i.e. 98% removal) within 5 days when incubated at 20 deg C(3). The screening studies using unadapted sludges gave similar results as the MITI test, and 2-nitrotoluene is confirmed

to be non biodegradable according to the standard MITI test. Using a mixed culture isolated from a contaminated soil (near an ammunition plant), 2-nitrotoluene (at initial concentrations of 3.5 mg/L) degraded completely in 8 days in aerobic batch and continuous reactor tests(4).

#### **Bioaccumulative potential**

The BCF for 2-nitrotoluene has been measured to be 12.5-29.9 (at a concentration of 0.1 ppm) and 6.6-29.7 (at 0.01 ppm) in carp (*Carpinus carpio*)(1). An estimated BCF of 15 was calculated for 2-nitrotoluene(SRC), using a log Kow of 2.30(2) and a regression-derived equation(3). According to a classification scheme(4), these BCF values suggest the potential for bioconcentration in aquatic organisms is low(SRC).

#### **Mobility in soil**

Using a structure estimation method based on molecular connectivity indices(1), the Koc of 2-nitrotoluene can be estimated to be 370(SRC). According to a classification scheme(2), this estimated Koc value suggests that 2-nitrotoluene is expected to have moderate mobility in soil. Field monitoring at a munition factory site in Melbourne Australia found that 2-nitrotoluene migrated large distances in the subsurface soils(3); 2-nitrotoluene is reported to have low soil Kd sorption coefficients in a variety of soils types(3) indicating it will leach.

#### **Other adverse effects**

no data available

### **SECTION 13: Disposal considerations**

#### **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**

**UN Number**

ADR/RID: UN1664 (For reference only, please check.)

IMDG: UN1664 (For reference only, please check.)

IATA: UN1664 (For reference only, please check.)

**UN Proper Shipping Name**

ADR/RID: NITROTOLUENES, LIQUID (For reference only, please check.)

IMDG: NITROTOLUENES, LIQUID (For reference only, please check.)

IATA: NITROTOLUENES, LIQUID (For reference only, please check.)

**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.)

**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.)

**Environmental hazards**

ADR/RID: Yes

IMDG: Yes

IATA: Yes

**Special precautions for user**

no data available

**Transport in bulk according to IMO instruments**

no data available

**SECTION 15: Regulatory information**

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

**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.

**(PICCS)**

Listed.

**Vietnam National Chemical Inventory**

Listed.

**IECSC)**

Listed.

**Korea Existing Chemicals List (KECL)**

Listed.

## **SECTION 16: Other information**

**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](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 may be necessary in case of poisoning with this substance; the appropriate means with instructions should be available. Do NOT take working clothes home. Depending on the degree of exposure, periodic medical examination is suggested.

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