

## Chemical Safety Data Sheet MSDS / SDS

## 2,4-dinitroaniline 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: 2,4-dinitroaniline  
CAS: 97-02-9

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

Relevant identified uses: For R&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 2, Oral  
Acute toxicity - Category 1, Dermal

Acute toxicity - Category 2, Inhalation  
Specific target organ toxicity - repeated exposure, Category 2  
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 2

### GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

### Hazard statement(s)

H300 Fatal if swallowed  
H310 Fatal in contact with skin  
H330 Fatal 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.  
P262 Do not get in eyes, on skin, or on clothing.  
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...  
P260 Do not breathe dust/fume/gas/mist/vapours/spray.  
P271 Use only outdoors or in a well-ventilated area.  
P284 [In case of inadequate ventilation] wear respiratory protection.  
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.  
P320 Specific treatment is urgent (see ... on this label).

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.

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

no data available

### **SECTION 3: Composition/information on ingredients**

#### **Substance**

Chemical name:	2,4-dinitroaniline
Common names and synonyms:	2,4-dinitroaniline
CAS number:	97-02-9
EC number:	202-553-5
Concentration:	100%

### **SECTION 4: First aid measures**

#### **Description of necessary first-aid measures**

##### **If inhaled**

Fresh air, rest. Refer for medical attention.

##### **Following skin contact**

Remove contaminated clothes. Rinse skin with plenty of water or shower. 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. Give one or two glasses of water to drink. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention .

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

May cause headache, nausea, stupor. Irritating to skin and mucous membrane. (USCG, 1999)

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

#### **Absorption, Distribution and Excretion**

The disposition of 2,4-dinitroaniline was studied in rats. Male Fisher 344 rats were administered 0 to 90.0  $\mu\text{mol/kg}$  (14)C labeled 2,4-dinitroaniline orally or 10.0  $\mu\text{mol/kg}$  intravenously. Urine, feces, and bile samples from cannulated rats were analyzed for (14)C activity up to 3 days after pretreatment. Selected rats were killed between 15 minutes and 3 days after dosing and the tissue distribution of 2,4-dinitroaniline was determined. Urine and bile samples were analyzed for metabolites. 2,4-Dinitroaniline was rapidly distributed to all major tissues. Muscle, skin, and adipose tissue contained 65 to 70% of the (14)C activity in the body during the 45 minutes after dosing. Clearance from all tissues was rapid, approximately 70 to 85% of the doses being cleared from most tissues within 6 hours after administration. Three days after administration the major tissues contained very low concentrations of (14)C and variations with dose and route of administration were minimal. Urinary excretion of (14)C activity accounted for 30% of the doses after 6 hours and 63% after 24 hours. Fecal excretion over 3 days accounted for 23% of the dose. Elimination of 2,4-dinitroaniline derived (14)C activity in the bile amounted to 12.5% of the dose after 5 hours. Nine metabolites were detected. 2,4-Dinitrophenylhydroxylamine was the main metabolite. 2,4-Dinitrophenylhydroxylamine was excreted in the urine as the sulfate conjugate and in bile as the glucuronide. /It was/ concluded that 2,4-dinitroaniline appears to have little potential for bioaccumulation in animal tissues. Amine hydroxylation and sulfation of 2,4-dinitroaniline are probable detoxification processes that occur rapidly and facilitate clearance.

## **SECTION 5: Firefighting measures**

### **Suitable extinguishing media**

Water, carbon dioxide, dry chemical

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

Special Hazards of Combustion Products: Vapors and combustion gases are irritating Behavior in Fire: May explode (USCG, 1999)

### **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**

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

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

### **Environmental precautions**

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

### **Methods and materials for containment and cleaning up**

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

## **SECTION 7: Handling and storage**

### **Precautions for safe handling**

NO open flames. 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 strong oxidants and food and feedstuffs. Well closed. Store in a cool, dry, well ventilated location. Separate from acids and oxidizing materials. Detached storage must be used.

## **SECTION 8: Exposure controls/personal protection**

### **Control parameters**

### **Occupational Exposure limit values**

no data available

### **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 safety goggles.

#### **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:	2,4-dinitroaniline is a yellow powder or crystals with a musty odor. Sinks in water. (USCG, 1999)
Colour:	YELLOW NEEDLES FROM DIL ACETONE, GREENISH-YELLOW PLATES FROM ALCOHOL.
Odour:	Musty odor

Melting point/freezing point:	177-180°C
Boiling point or initial boiling point and boiling range:	400.6°C at 760mmHg
Flammability:	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	224°C
Auto-ignition temperature:	no data available
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	no data available
Solubility:	less than 0.1 mg/mL at 73° F (NTP, 1992)
Partition coefficient n-octanol/water:	log Kow= 1.84 (est)
Vapour pressure:	5.94X10 <sup>-7</sup> mm Hg at 25 deg C (est)
Density and/or relative density:	1.615
Relative vapour density:	6.31 (NTP, 1992) (Relative to Air)
Particle characteristics:	no data available

## SECTION 10: Stability and reactivity

**Reactivity**

May explode on heating or on friction. Decomposes on heating. This produces toxic fumes including nitrogen oxides. Reacts with oxidants.

**Chemical stability**

no data available

**Possibility of hazardous reactions**

SLIGHT, WHEN EXPOSED TO HEAT OR FLAME. 2,4-DINITROANILINE may decompose violently at elevated temperatures. This compound can react with oxidizing materials, i.e. chlorine/hydrochloric acid. (NTP, 1992). In mixture with powdered charcoal ignited upon heating, [Cahiers, 1980, (99), 278].

**Conditions to avoid**

no data available

**Incompatible materials**

Disaster hazard: ... it can react with oxidizing materials.

**Hazardous decomposition products**

When heated to decomp, it emits highly toxic fumes.

**SECTION 11: Toxicological information****Acute toxicity**

Oral: no data available

Inhalation: no data available

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**

no data available

**Reproductive toxicity**

no data available

**STOT-single exposure**

The substance is irritating to the eyes, skin and respiratory tract.

**STOT-repeated exposure**

The substance may have effects on the blood. This may result in the formation of methaemoglobin.

**Aspiration hazard**

No indication can be given about the rate at which a harmful concentration of this substance in the air is reached on evaporation at 20°C.

**SECTION 12: Ecological information****Toxicity**

Toxicity to fish: LC50 *Pimephales promelas* (fathead minnow) 14.2 mg/l/96 hr (Confidence limit 13.5 to 15.0 mg/l). Affected fish lost schooling behavior and swam near the tank surface with half being hyperactive and half hypoactive. They had increased respiration and hemorrhaging, were darkly colored, and lost equilibrium prior to death.

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

#### **Persistence and degradability**

2,4-Dinitroaniline at an initial concn of 100 ppm showed no biodegradation in river and sea water after 3 days using a cultivation test method(1).

#### **Bioaccumulative potential**

Based on an estimated log Kow of 1.84(2), the bioconcentration factor (BCF) for 2,4-dinitroaniline can be estimated to be about 15 from a recommended regression-derived equation(1, SRC). This BCF value suggests that bioconcentration in aquatic organisms may not be significant(SRC).

#### **Mobility in soil**

Aromatic amines have been observed to undergo rapid and reversible covalent bonding with humic materials in aqueous solution; the initial bonding reaction is followed by a slower and much less reversible reaction believed to represent the addition of the amine to quinoidal structures followed by oxidation of the product to give an amino-substituted quinone; these processes represent pathways by which aromatic amines may be converted to latent forms in the biosphere(3). In the absence of covalent bonding, a Koc of approximately 240 can be estimated for 2,4-dinitroaniline based on an estimated log Kow of 1.84(2) and a recommended regression-derived equation(1, SRC); this Koc value suggests medium soil mobility(4).

#### **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: UN1596 (For reference only, please check.)

IMDG: UN1596 (For reference only, please check.)

IATA: UN1596 (For reference only, please check.)

### UN Proper Shipping Name

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

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

IATA: DINITROANILINES (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 is necessary in case of poisoning with this substance; the appropriate means with instructions must be available.

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