

# 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 1,2-Dinitrobenzene

### 1.2 Other means of identification

Product number CCEM500042  
Other names o-dinitrobenzene; o-dimethylbenzene; ortho-dinitrobenzene

### 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 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, short-term (Acute) - Category Acute 1  
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

### 2.2 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  
H410 Very 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.

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Response</b> | <p>P301+P316 IF SWALLOWED: Get emergency medical help immediately.</p> <p>P321 Specific treatment (see ... on this label).</p> <p>P330 Rinse mouth.</p> <p>P302+P352 IF ON SKIN: Wash with plenty of water/...</p> <p>P316 Get emergency medical help immediately.</p> <p>P361+P364 Take off immediately all contaminated clothing and wash it before reuse.</p> <p>P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.</p> <p>P320 Specific treatment is urgent (see ... on this label).</p> <p>P319 Get medical help if you feel unwell.</p> <p>P391 Collect spillage.</p> |
| <b>Storage</b>  | <p>P405 Store locked up.</p> <p>P403+P233 Store in a well-ventilated place. Keep container tightly closed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Disposal</b> | <p>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.</p>                                                                                                                                                                                                                                                                                                                                                                                                              |

## 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 |
|--------------------|---------------------------|------------|-----------|---------------|
| 1,2-Dinitrobenzene | 1,2-dinitrobenzene        | 528-29-0   | 208-431-8 | 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

Remove contaminated clothes. 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. Give a slurry of activated charcoal in water to drink. Refer for medical attention .

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

INHALATION, INGESTION, OR SKIN ABSORPTION: Headache, vertigo and vomiting followed by exhaustion, numbness of the legs, staggering and collapse. Intense methemoglobinemia may lead to asphyxia severe enough to injure the CNS. EYES: Irritation. SKIN: Stains skin yellow. (USCG, 1999)

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

Basic treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for shock and treat if necessary . Anticipate seizures and treat if necessary . For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport . Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal . Aniline and related compounds

## SECTION 5: Fire-fighting measures

### 5.1 Suitable extinguishing media

For rescue purposes wear full protective clothing. fight fire from an explosion-resistant location. In advanced or massive fires, area should be evacuated. If fire occurs in vicinity of this material water should be used to keep containers cool.

### 5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Emits highly toxic fumes of oxides of nitrogen. May explode. Behavior in Fire: Severe explosion hazard when exposed to heat or flame, or when shocked. (USCG, 1999)

### 5.3 Special protective actions for fire-fighters

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

## SECTION 6: Accidental release measures

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

Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. 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.

## 6.2 Environmental precautions

Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. 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.

## 6.3 Methods and materials for containment and cleaning up

1. Remove all ignition sources. 2. Ventilate area of spill. 3. For small quantities, sweep onto paper or other suitable material and burn in suitable combustion chamber which allows burning in unconfined condition & is equipped with appropriate effluent gas cleaning device. Large quantities may be reclaimed; however, if this is not practical, dissolve in fuel oil and atomize in suitable combustion chamber equipped with an appropriate effluent gas cleaning device.

# SECTION 7: Handling and storage

## 7.1 Precautions for safe handling

NO open flames. Closed system, dust explosion-proof electrical equipment and lighting. Prevent deposition of dust. 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 strong oxidants, strong bases and food and feedstuffs. See Chemical Dangers. STORE ONLY IN PERMANENT MAGAZINE. THIS HIGH EXPLOSIVE SHOULD BE KEPT WELL AWAY FROM INITIATOR EXPLOSIVES; PROTECTED FROM PHYSICAL DAMAGE; SEPARATED FROM OXIDIZING MATERIALS, COMBUSTIBLES, & SOURCES OF HEAT.

# SECTION 8: Exposure controls/personal protection

## 8.1 Control parameters

### Occupational Exposure limit values

TLV: 0.15 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 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                                           | O-dinitrobenzene is a colorless to yellow solid. Sinks and slowly mixes with water. (USCG, 1999) |
| Colour                                                   | COLORLESS OR YELLOW CRYSTALS, NEEDLES OR PLATES                                                  |
| Odour                                                    | no data available                                                                                |
| Melting point/freezing point                             | 33°C(lit.)                                                                                       |
| Boiling point or initial boiling point and boiling range | 194°C/30mmHg(lit.)                                                                               |
| Flammability                                             | Combustible Solid                                                                                |
| Lower and upper explosion limit/flammability limit       | no data available                                                                                |
| Flash point                                              | 65°C(lit.)                                                                                       |
| Auto-ignition temperature                                | no data available                                                                                |
| Decomposition temperature                                | no data available                                                                                |
| pH                                                       | no data available                                                                                |
| Kinematic viscosity                                      | no data available                                                                                |

|                                              |                                        |
|----------------------------------------------|----------------------------------------|
| <b>Solubility</b>                            | 0.05 % (NIOSH, 2016)                   |
| <b>Partition coefficient n-octanol/water</b> | log Kow = 1.69                         |
| <b>Vapour pressure</b>                       | 4.55X10 <sup>-5</sup> mm Hg @ 25 deg C |
| <b>Density and/or relative density</b>       | 1.31 g/cm <sup>3</sup> (20°C)          |
| <b>Relative vapour density</b>               | 5.79 (AIR= 1)                          |
| <b>Particle characteristics</b>              | no data available                      |

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

May explode on heating even in the absence of air. On combustion, forms toxic gases and fumes including nitrogen oxides. Reacts violently with strong oxidants, strong bases and reducing metals such as zinc and tin. This generates fire and explosion hazard. Mixtures with nitric acid are highly explosive.

### 10.2 Chemical stability

no data available

### 10.3 Possibility of hazardous reactions

Combustible when exposed to heat or flame; can react vigorously with oxidizing materials. Dust explosion possible if in powder or granular form, mixed with air. All three isomers have similar properties and may react vigorously with oxidizing materials. Their reaction with nitric acid (nitration) will lead to a mixture of trinitrobenzenes possessing high-explosive properties [Urbanski, 1967, vol. 3, p. 290]. If heat and reaction conditions of the nitration are not controlled, detonation comparable to TNT may occur [Anon., J. R. Inst. Chem., 1960, 84, p. 451]. Mixture of 1,3-dinitrobenzene with tetranitromethane was found highly explosive [Urbanski, 1964, vol. 1, 592]. 1,2-dinitrobenzene is a severe explosion hazard when shocked or exposed to heat or flame. When heated to decomposition all dinitrobenzenes emit toxic fumes of nitrogen oxides [Sax, 9th ed., 1996, p. 1374].

### 10.4 Conditions to avoid

no data available

### 10.5 Incompatible materials

Contact with strong oxidizers may cause fires & explosions. Contact with caustics & metals such as tin & zinc may cause evolution of heat & incr in pressure.

### 10.6 Hazardous decomposition products

When heated to decomposition it emits highly toxic fumes of /nitrogen oxides/, & explodes.

## 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

CLASSIFICATION: D; not classifiable as to human carcinogenicity. BASIS FOR CLASSIFICATION: Based on no data in humans and animals. HUMAN CARCINOGENICITY DATA: None. ANIMAL CARCINOGENICITY DATA: None.

### Reproductive toxicity

no data available

### STOT-single exposure

The substance is irritating to the eyes and respiratory tract. 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. This may result in liver impairment. The substance may have effects on the blood. This may result in anaemia.

### 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

### 12.1 Toxicity

- Toxicity to fish: no data available
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

### 12.2 Persistence and degradability

Decomposition by a soil microflora: > 64 days.

### 12.3 Bioaccumulative potential

A BCF value of 10 was measured for 1,2-dinitrobenzene in fish(1). BCF values of 2-38 were measured in carp exposed to dinitrobenzene (isomer not specified) over a 6 week incubation period(2). According to a classification scheme(3), these BCF values suggest bioconcentration in aquatic organisms is low to moderate(SRC).

### 12.4 Mobility in soil

The Koc of 1,2-dinitrobenzene is estimated as 200(SRC), using a measured log Kow of 1.69(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that 1,2-dinitrobenzene is expected to have moderate mobility in soil. It has been shown that nitrophenols and nitrobenzenes adsorb strongly to clay through an interaction between the nitro group and the water molecules or metallic cations in the clay(4). However, it has also been shown that ortho substituents on the benzene ring, as in the case of 1,2-dinitrobenzene, diminish this adsorption due to steric effects(5). The adsorption of 1,4-dinitrobenzene and 1,2-dinitrobenzene was studied in monmorillonite, kaolinite and illite clays(5). Adsorption coefficients (Kd) of 188, 1,460 and 3,100 L/kg were measured in kaolinite, illite and monmorillonite, respectively for 1,4-dinitrobenzene, while the adsorption coefficients were only 0.4, 2.5 and 4.2 L/kg for 1,2-dinitrobenzene(5).

### 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: UN1597 (For reference only, please check.) IMDG: UN1597 (For reference only, please check.) IATA: UN1597 (For reference only, please check.)

### 14.2 UN Proper Shipping Name

ADR/RID: DINITROBENZENES, LIQUID (For reference only, please check.) IMDG: DINITROBENZENES, LIQUID (For reference only, please check.) IATA: DINITROBENZENES, LIQUID (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   |
|--------------------------------------------------------------------------|---------------------------|------------|-------------|
| 1,2-dinitrobenzene                                                       | 1,2-dinitrobenzene        | 528-29-0   | 208-431-8   |
| European Inventory of Existing Commercial Chemical Substances (EINECS)   |                           |            | Listed.     |
| EC Inventory                                                             |                           |            | Listed.     |
| United States Toxic Substances Control Act (TSCA) Inventory              |                           |            | Not 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

Creation Date July 15, 2019  
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](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

Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is suggested. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available. See ICSCs 0691, 0692 and 0725.

Any questions regarding this SDS, Please send your inquiry to [info@cato-chem.com](mailto:info@cato-chem.com)

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