

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.1
Creation Date: July 15, 2019
Revision Date: April 26, 2024

SECTION 1: Identification

1.1 GHS Product identifier

Product name 1,3-Phenylenediamine

1.2 Other means of identification

Product number CCHM700011

Other names Benzene-1,3-diamine; 1,3-Benzenediamine; m-Phenylenediamine

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

Eye irritation, Category 2

Skin sensitization, Category 1

Acute toxicity - Category 3, Inhalation

Germ cell mutagenicity, 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)

H301 Toxic if swallowed

H311 Toxic in contact with skin

H319 Causes serious eye irritation

H317 May cause an allergic skin reaction

H331 Toxic if inhaled

H341 Suspected of causing genetic defects

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.

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

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

P272 Contaminated work clothing should not be allowed out of the workplace.

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

P203 Obtain, read and follow all safety instructions before use.

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. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P333+P317 If skin irritation or rash occurs: Get medical help. P362+P364 Take off contaminated clothing and wash it before reuse. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P318 IF exposed or concerned, get medical advice. 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
1,3-Phenylenediamine	m-phenylenediamine	108-45-2	203-584-7	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. 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. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

SYMPTOMS: Symptoms of exposure to this chemical may include skin sensitization reactions, eye irritation and injury, skin irritation, dermatitis, blackened skin and bronchial asthma. Other symptoms may include allergic skin reactions, irritation of the mucous membranes, nose, throat and lungs, coughing, burning sensation, runny nose, sore throat, methemoglobinemia, cyanosis, headache, dizziness, drowsiness, mental confusion, pulmonary edema, kidney and liver damage, central nervous system effects and conjunctivitis. Eye contact may cause discomfort, tearing, blurring of vision, reddening, partial clouding of the cornea and swelling of the eye and surrounding tissue. Dysuria and eosinophiluria may also occur. Exposure may also result in respiratory tract irritation. **ACUTE/CHRONIC HAZARDS:** This compound is harmful if inhaled, swallowed or absorbed through the skin. It causes irritation of the eyes, skin, mucous membrane and respiratory tract. When heated to decomposition, this compound emits irritating and/or toxic gases and fumes of carbon monoxide, carbon dioxide and oxides of nitrogen. (NTP, 1992)

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

For immediate first aid: Ensure that adequate decontamination has been carried out. If victim is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask as trained. Perform CPR if 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 victim quiet and maintain normal body temperature. Obtain medical attention. Organic bases, amines, and related compounds

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Excerpt from ERG Guide 153 [Substances - Toxic and/or Corrosive (Combustible)]: **SMALL FIRE:** Dry chemical, CO₂ or water spray. **LARGE FIRE:** Dry chemical, CO₂, alcohol-resistant foam or water spray. Move containers from fire area if you can do it without risk. Dike fire-control water for later disposal; do not scatter the material. **FIRE INVOLVING TANKS OR CAR/TRAILER LOADS:** Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Do not get water inside containers. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. **ALWAYS** stay away from tanks engulfed in fire. (ERG, 2016)

5.2 Specific hazards arising from the chemical

This chemical is combustible. Dust may form explosive mixtures in air (NTP, 1992)

5.3 Special protective actions for fire-fighters

Use water spray, powder.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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

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. Do NOT let this chemical enter the environment. Personal protection: complete protective clothing including self-contained breathing apparatus.

6.3 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

7.1 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.

7.2 Conditions for safe storage, including any incompatibilities

Separated from strong oxidants and food and feedstuffs. Keep in the dark. Well closed. KEEP WELL CLOSED & PROTECTED FROM LIGHT.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 0.1 mg/m³, as TWA; A4 (not classifiable as a human carcinogen). MAK: skin absorption (H); sensitization of skin (SH); 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. Flakes.
Colour	WHITE CRYSTALS BECOMING RED ON EXPOSURE TO AIR
Odour	no data available
Melting point/freezing point	63.2 °C. Atm. press.: 101.3 kPa. Remarks: 63.2 °C.
Boiling point or initial boiling point and boiling range	284 °C. Atm. press.: 101.3 kPa. Remarks: 284 °C.
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	187 °C
Auto-ignition temperature	1040° F (NTP, 1992)
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	Miscible with water
Partition coefficient n-octanol/water	log Pow = -0.39.
Vapour pressure	0.038 Pa. Temperature:20 °C. Remarks:At 20 ± 1 °C, ± 1.73 x 10-4 Pa.
Density and/or relative density	709 g/L. Temperature:22 °C.
Relative vapour density	3.7 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on burning. This produces toxic fumes including nitrogen oxides. Reacts with strong oxidants.

10.2 Chemical stability

Unstable in air

10.3 Possibility of hazardous reactions

FIRE POINT: 175 DEG C.1,3-PHENYLENEDIAMINE an aromatic amine, neutralizes acids, acid chlorides, acid anhydrides and chloroformates in exothermic reactions to form salts. May be incompatible with isocyanates, halogenated organics, peroxides, phenols (acidic), epoxides, anhydrides, and acid halides. Incompatible with oxidizing agents (NTP, 1992).

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

STABILITY: This compound is sensitive to light. It turns red on exposure to air. This compound darkens on storage. Moist air and excess heat cause it to degrade. Solutions of this chemical in water, DMSO, 95% ethanol or acetone should be stable for 24 hours under normal lab conditions.REACTIVITY: This compound is incompatible with oxidizing agents. It is also incompatible with acids, acid chlorides, acid anhydrides and chloroformates. (NTP, 1992)

10.6 Hazardous decomposition products

When heated to decomp, it emits toxic fumes of nitrogen oxides.

SECTION 11: Toxicological information

Acute toxicity

- Oral: Approximate Lethal Dose (ALD) - rat (male) - 450 mg/kg bw.
- Inhalation: LC50 - rat (male) - 3.2 mg/L air (analytical).
- Dermal: Approximate Lethal Dose (ALD) - rabbit (male) - 1 500 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

No data are available in humans. Inadequate evidence of carcinogenicity in animals. OVERALL EVALUATION: Group 3: The agent is not classifiable as to its carcinogenicity to humans.

Reproductive toxicity

no data available

STOT-single exposure

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

STOT-repeated exposure

Repeated or prolonged contact may cause skin sensitization. The substance may have effects on the kidneys. This may result in renal

failure.

Aspiration hazard

A harmful contamination of the air will not or will only very slowly be reached on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 - *Oncorhynchus mykiss* (previous name: *Salmo gairdneri*) - 512 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: LC50 - *Gammarus fasciatus* - 4.6 mg/L - 96 h.
- Toxicity to algae: NOEC - *Pseudokirchneriella subcapitata* (previous names: *Raphidocelis subcapitata*, *Selenastrum capricornutum*) - 0.915 mg/L - 96 h.
- Toxicity to microorganisms: 30% reduction in respiration rate - activated sludge of a predominantly industrial sewage - 100 mg/L - 30 min. Remarks: Respiration rate.

12.2 Persistence and degradability

1,3-Benzenediamine was observed to degrade 60% after 5 days at concn levels of 25 to 30 ppm using an acclimated activated sludge inoculum(1). However at 50 ppm 1,3-benzenediamine was reported to be toxic to 3 unacclimated activated sludges(2). Soil microflora did not cleave the benzene ring of 1,3-benzenediamine in 64 days(3). 1,3-Benzenediamine, present at an initial concn of 100 mg/l, reached 2% of its theoretical BOD in 4 weeks using an activated sludge inoculum(4).

12.3 Bioaccumulative potential

An estimated BCF value of 0.33 was calculated for 1,3-benzenediamine(SRC), using an estimated log Kow of -0.33(1) and a recommended regression-derived equation(2). BCF values of 1.3 to 4.6 and <1.6 to 24 were measured for 1,3-benzenediamine in carp at 2 and 0.2 mg/l, respectively(3). According to a classification scheme(4), these BCF values suggest that bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil

The Koc of 1,3-benzenediamine is estimated as approximately 16(SRC), using a measured log Kow of -0.33(1) and a regression-derived equation(2,SRC). According to a recommended classification scheme(3), this estimated Koc value suggests that 1,3-benzenediamine is expected to have very high mobility in soil(SRC). However, anilines are expected to bind strongly to humus or organic matter in soils due to the high reactivity of the aromatic amino group(4,5); therefore, mobility may be much lower in some soils(SRC).

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: UN1673 (For reference only, please check.) IMDG: UN1673 (For reference only, please check.) IATA: UN1673 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: PHENYLENEDIAMINES (o-, m-, p-) (For reference only, please check.) IMDG: PHENYLENEDIAMINES (o-, m-, p-) (For reference only, please check.) IATA: PHENYLENEDIAMINES (o-, m-, p-) (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: III (For reference only, please check.) IMDG: III (For reference only, please check.) IATA: III (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
m-phenylenediamine	m-phenylenediamine	108-45-2	203-584-7
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

Creation Date July 15, 2019
Revision Date April 26, 2024

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

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 ICSC 0805.

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

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