

**SIGMA-ALDRICH**

sigma-aldrich.com

**Material Safety Data Sheet**Version 4.2  
Revision Date 07/11/2011  
Print Date 12/05/2011**1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : **o-Phenylenediamine**

Product Number : P9029  
Brand : Sigma

Supplier : Sigma-Aldrich  
3050 Spruce Street  
SAINT LOUIS MO 63103  
USA

Telephone : +1 800-325-5832  
Fax : +1 800-325-5052  
Emergency Phone # (For both supplier and manufacturer) : (314) 776-6555

Preparation Information : Sigma-Aldrich Corporation  
Product Safety - Americas Region  
1-800-521-8956

**2. HAZARDS IDENTIFICATION****Emergency Overview****OSHA Hazards**

Target Organ Effect, Toxic by inhalation., Toxic by ingestion, Harmful by skin absorption., Skin sensitiser, Irritant, Carcinogen, Mutagen

**Target Organs**

Bladder, Liver, Kidney

**GHS Classification**

Acute toxicity, Inhalation (Category 4)  
Acute toxicity, Dermal (Category 4)  
Acute toxicity, Oral (Category 3)  
Eye irritation (Category 2A)  
Skin sensitization (Category 1)  
Germ cell mutagenicity (Category 2)  
Carcinogenicity (Category 2)  
Specific target organ toxicity - single exposure (Category 2)  
Acute aquatic toxicity (Category 1)  
Chronic aquatic toxicity (Category 1)

**GHS Label elements, including precautionary statements**

Pictogram

Signal word : **Danger**

Hazard statement(s)

H301 Toxic if swallowed.  
H312 + H332 Harmful in contact with skin or if inhaled.  
H317 May cause an allergic skin reaction.  
H319 Causes serious eye irritation.  
H341 Suspected of causing genetic defects.  
H351 Suspected of causing cancer.

H371 May cause damage to organs.  
H410 Very toxic to aquatic life with long lasting effects.

**Precautionary statement(s)**

P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/ protective clothing.  
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P501 Dispose of contents/ container to an approved waste disposal plant.

**HMIS Classification**

Health hazard: 2  
Chronic Health Hazard: \*  
Flammability: 1  
Physical hazards: 0

**NFPA Rating**

Health hazard: 2  
Fire: 1  
Reactivity Hazard: 0

**Potential Health Effects**

Inhalation Toxic if inhaled. Causes respiratory tract irritation.  
Skin Causes skin irritation.  
Eyes Causes eye irritation.  
Ingestion Toxic if swallowed.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Synonyms : OPD  
1,2-Diaminobenzene  
1,2-Phenylenediamine

Formula : C<sub>6</sub>H<sub>8</sub>N<sub>2</sub>  
Molecular Weight : 108.14 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
<b>o-Phenylenediamine</b>			
95-54-5	202-430-6	612-145-00-2	-

**4. FIRST AID MEASURES****General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

**In case of eye contact**

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**5. FIRE-FIGHTING MEASURES****Conditions of flammability**

Not flammable or combustible.

**Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Special protective equipment for fire-fighters**

Wear self contained breathing apparatus for fire fighting if necessary.

**Hazardous combustion products**

Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx)

**6. ACCIDENTAL RELEASE MEASURES****Personal precautions**

Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

**Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

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

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

**7. HANDLING AND STORAGE****Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.

**Conditions for safe storage**

Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature: 2 - 8 °C

Moisture sensitive. Store under nitrogen. May darken on storage

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Components with workplace control parameters**

Components	CAS-No.	Value	Control parameters	Basis
o-Phenylenediamine	95-54-5	TWA	0.1 mg/m <sup>3</sup>	USA. ACGIH Threshold Limit Values (TLV)
Remarks	Anemia Confirmed animal carcinogen with unknown relevance to humans: The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) that may not be relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence does not suggest that the agent is likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.			

**Personal protective equipment****Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Eye protection**

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin and body protection**

Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures**

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

**9. PHYSICAL AND CHEMICAL PROPERTIES****Appearance**

Form solid  
Colour white, tan

**Safety data**

pH 8.7  
Melting point/freezing point Melting point/range: 100 - 102 °C (212 - 216 °F)  
Boiling point 256 - 258 °C (493 - 496 °F)  
Flash point 136 °C (277 °F) - closed cup  
Ignition temperature no data available  
Autoignition temperature no data available  
Lower explosion limit 1.5 %(V)  
Vapour pressure 3.27 hPa (2.45 mmHg) at 100 °C (212 °F)  
0.01 hPa (0.01 mmHg) at 25 °C (77 °F)  
Density 1.030 g/cm<sup>3</sup>  
Water solubility soluble  
Partition coefficient: n-octanol/water log Pow: 0.15  
Relative vapour density no data available  
Odour no data available  
Odour Threshold no data available  
Evaporation rate no data available

**10. STABILITY AND REACTIVITY****Chemical stability**

Stable under recommended storage conditions.

**Possibility of hazardous reactions**

no data available

**Conditions to avoid**

no data available

**Materials to avoid**

Strong oxidizing agents

**Hazardous decomposition products**

Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx)  
Other decomposition products - no data available

**11. TOXICOLOGICAL INFORMATION****Acute toxicity****Oral LD50**

LD50 Oral - rat - 510 mg/kg

Remarks: Autonomic Nervous System:Other (direct) parasymphomimetic. Behavioral:Convulsions or effect on seizure threshold. Behavioral:Muscle weakness.

LD50 Oral - mouse - 366 mg/kg

LD50 Oral - rat - 1,070 mg/kg

**Inhalation LC50**

LC50 Inhalation - rat - 4 h - 3.4 mg/l

**Dermal LD50**

**Other information on acute toxicity**  
no data available

**Skin corrosion/irritation**

no data available

**Serious eye damage/eye irritation**

no data available

**Respiratory or skin sensitization**

May cause allergic skin reaction.

The preceding data, or interpretation of data, was determined using Quantitative Structure Activity Relationship (QSAR) modeling.

**Germ cell mutagenicity**

In vitro tests showed mutagenic effects

Genotoxicity in vitro - rat - Liver

Unscheduled DNA synthesis

Genotoxicity in vitro - Human - lymphocyte

DNA damage

Genotoxicity in vitro - Human - HeLa cell

DNA inhibition

Genotoxicity in vitro - Human - lymphocyte

Sister chromatid exchange

Genotoxicity in vivo - mouse - Oral

DNA inhibition

Genotoxicity in vivo - mouse - Oral

Micronucleus test

**Carcinogenicity**

Limited evidence of carcinogenicity in animal studies

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**Reproductive toxicity**

no data available

**Teratogenicity**

no data available

**Specific target organ toxicity - single exposure (Globally Harmonized System)**  
May cause damage to organs.

**Specific target organ toxicity - repeated exposure (Globally Harmonized System)**  
no data available

**Aspiration hazard**

no data available

**Potential health effects**

<b>Inhalation</b>	Toxic if inhaled. Causes respiratory tract irritation.
<b>Ingestion</b>	Toxic if swallowed.
<b>Skin</b>	Causes skin irritation.
<b>Eyes</b>	Causes eye irritation.

**Synergistic effects**

no data available

**Additional Information**

RTECS: Not available

**12. ECOLOGICAL INFORMATION****Toxicity**

Toxicity to daphnia and other aquatic invertebrates.	EC50 - Daphnia magna (Water flea) - 1.4 mg/l - 48 h
--	---

**Persistence and degradability**

no data available

**Bioaccumulative potential**

no data available

**Mobility in soil**

no data available

**PBT and vPvB assessment**

no data available

**Other adverse effects**

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Very toxic to aquatic life with long lasting effects.

**13. DISPOSAL CONSIDERATIONS****Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**Contaminated packaging**

Dispose of as unused product.

**14. TRANSPORT INFORMATION**

**DOT (US)**

UN number: 1673 Class: 6.1 Packing group: III  
Proper shipping name: Phenylenediamines  
Marine pollutant: No  
Poison Inhalation Hazard: No

**IMDG**

UN number: 1673 Class: 6.1 Packing group: III EMS-No: F-A, S-A  
Proper shipping name: PHENYLENEDIAMINES  
Marine pollutant: No

**IATA**

UN number: 1673 Class: 6.1 Packing group: III  
Proper shipping name: Phenylenediamines

---

**15. REGULATORY INFORMATION****OSHA Hazards**

Target Organ Effect, Toxic by inhalation., Toxic by ingestion, Harmful by skin absorption., Skin sensitiser, Irritant, Carcinogen, Mutagen

**SARA 302 Components**

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
o-Phenylenediamine	95-54-5	2007-07-01

**SARA 311/312 Hazards**

Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**

	CAS-No.	Revision Date
o-Phenylenediamine	95-54-5	2007-07-01

**Pennsylvania Right To Know Components**

	CAS-No.	Revision Date
o-Phenylenediamine	95-54-5	2007-07-01

**New Jersey Right To Know Components**

	CAS-No.	Revision Date
o-Phenylenediamine	95-54-5	2007-07-01

**California Prop. 65 Components**

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. o-Phenylenediamine	95-54-5	2007-09-28

---

**16. OTHER INFORMATION****Further information**

Copyright 2011 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.  
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. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.