



MATERIAL SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 08/15/2013

Version 1.1

SECTION 1. Identification

Product identifier

| | |
|----------------|------------------------------------|
| Product number | 807246 |
| Product name | 1,4-Phenylenediamine for synthesis |

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

| | |
|-----------------|------------------------|
| Identified uses | Chemical for synthesis |
|-----------------|------------------------|

Details of the supplier of the safety data sheet

| | |
|---------|---|
| Company | EMD Millipore Corporation 290 Concord Road, Billerica, MA 01821, United States of America SDS Phone Support: +1-978-715-1335 General Inquiries: +1-978-715-4321 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5) |
|---------|---|

| | |
|---------------------|--|
| Emergency telephone | 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week |
|---------------------|--|

SECTION 2. Hazards identification

GHS Classification

Acute toxicity, Category 3, Inhalation, H331
Acute toxicity, Category 3, Dermal, H311
Acute toxicity, Category 3, Oral, H301
Eye irritation, Category 2, H319
Skin sensitization, Category 1, H317
Acute aquatic toxicity, Category 1, H400
Chronic aquatic toxicity, Category 1, H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms



Signal Word

Danger

Hazard Statements

H331 Toxic if inhaled.

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H311 Toxic in contact with skin.
H301 Toxic if swallowed.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements

P280 Wear protective gloves.
P273 Avoid release to the environment.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P309 + P310 IF exposed or if you feel unwell: Immediately call a POISON CENTER or doctor/physician.

OSHA Hazards

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Other hazards

None known.

SECTION 3. Composition/information on ingredients

| | |
|------------|---|
| Formula | C ₆ H ₈ N ₂ (Hill) |
| CAS-No. | 106-50-3 |
| Molar mass | 108.14 g/mol |

Hazardous ingredients

Chemical Name (Concentration)

CAS-No.

p-phenylenediamine (>= 90 % - <= 100 %)
106-50-3

SECTION 4. First aid measures

Description of first-aid measures

General advice

First aider needs to protect himself.

Inhalation

After inhalation: fresh air. If breathing stops: immediately apply artificial respiration, if necessary oxygen. Immediately call in physician.

Skin contact

In case of skin contact: Rewash with plenty of water. Immediately remove contaminated clothing. Call a physician immediately.

Eye contact

After eye contact: rinse out with plenty of water. Call in ophthalmologist.

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Ingestion

If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Allergic reactions, irritant effects, Nausea, Vomiting, Methemoglobinemia with headache, cardiac arrhythmia, drop in blood pressure, dyspnoea, and spasms, key symptom: cyanosis (blue coloration of the blood).

Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Water, Carbon dioxide (CO₂), Foam, Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

Special hazards arising from the substance or mixture

Combustible.

Vapors are heavier than air and may spread along floors.

Risk of dust explosion.

Forms explosive mixtures with air on intense heating.

Development of hazardous combustion gases or vapors possible in the event of fire.

Fire may cause evolution of:

nitrous gases, nitrogen oxides

Advice for firefighters

Special protective equipment for fire-fighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid substance contact. Avoid generation and inhalation of dusts in all circumstances. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

Environmental precautions

Do not empty into drains.

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Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

SECTION 7. Handling and storage

Precautions for safe handling

Observe label precautions.

Work under hood. Do not inhale substance/mixture.

Conditions for safe storage, including any incompatibilities

Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Store at +15°C to +25°C (+59°F to +77°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

| Basis | Value | Threshold limits | Remarks |
|-------------------------------------|--|-----------------------|-----------------------------------|
| <i>p</i> -phenylenediamine 106-50-3 | | | |
| ACGIH | Time Weighted Average (TWA): | 0.1 mg/m ³ | |
| NIOSH/GUIDE | Recommended exposure limit (REL): Skin designation: | 1 mg/m ³ | Can be absorbed through the skin. |
| OSHA_TRANS | PEL: | 0.1 mg/m ³ | |
| | Skin designation: | | Can be absorbed through the skin. |
| Z1A | Time Weighted Average (TWA): Skin designation (Final Rule Limit applies): | 0.1 mg/m ³ | Can be absorbed through the skin. |

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection

Safety glasses

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Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Other protective equipment:

protective clothing

Respiratory protection

required when dusts are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

SECTION 9. Physical and chemical properties

| | |
|-----------------------------|--|
| Physical state | solid |
| Color | light gray |
| Odor | weakly amine-like |
| Odor Threshold | No information available. |
| pH | ca. 9 at 50 g/l 68 °F (20 °C) |
| Melting point | 139 - 141 °C |
| Boiling point/boiling range | 513 °F (267 °C) at 1,013 hPa |
| Flash point | 313 °F (156 °C) Method: c.c. |
| Evaporation rate | No information available. |
| Flammability (solid, gas) | No information available. |
| Lower explosion limit | 1.5 %(V) |
| Upper explosion limit | 9.8 %(V) |
| Vapor pressure | 0.01 hPa at 68 °F (20 °C) |
| Relative vapor density | 3.72 |
| Relative density | 1.135 g/cm ³ at 68 °F (20 °C) |

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| | | |
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| | |
|--|--|
| Water solubility | 47 g/l at 77 °F (25 °C) |
| Partition coefficient: n-octanol/water | log Pow: -0.30 (experimental) (Lit.) Bioaccumulation is not expected (log Pow <1). |
| Autoignition temperature | No information available. |
| Decomposition temperature | > 932 °F (> 500 °C) |
| Viscosity, dynamic | No information available. |
| Explosive properties | Not classified as explosive. |
| Ignition temperature | 1053 °F (567 °C) at 1,013 hPa |
| Minimum ignition energy | 30 mJ |
| Bulk density | ca. 600 kg/m ³ |

SECTION 10. Stability and reactivity

Reactivity

Forms explosive mixtures with air on intense heating.

The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

Chemical stability

Sensitive to air.

Possibility of hazardous reactions

Violent reactions possible with:

Strong oxidizing agents, organic nitro compounds, Alkali metals, Alkaline earth metals, Isocyanates, acids

Caution! In contact with nitrites, nitrates, nitrous acid possible liberation of nitosamines!

Conditions to avoid

Strong heating (decomposition).

A range from approx. 15 Kelvin below the flash point is to be rated as critical.

Incompatible materials

no information available

Hazardous decomposition products

in the event of fire: See section 5.

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SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Eye contact, Skin contact, Ingestion

Target Organs

Respiratory system

Skin

Acute oral toxicity

LD50 rat: 80 mg/kg (IUCLID)

absorption

Symptoms: Nausea, Vomiting

Acute inhalation toxicity

LC50 rat: 0.92 mg/l; 4 h (RTECS)

absorption

Symptoms: Possible damages:, mucosal irritations

Acute dermal toxicity

LD50 rabbit: > 7,940 mg/kg

(Lit.) (Regulation (EC) No 1272/2008, Annex VI)

absorption

Skin irritation

Possible damages: slight irritation

Eye irritation

rabbit

Result: slight irritation

(Lit.)

Causes serious eye irritation.

Sensitization

May cause an allergic skin reaction.

Specific target organ systemic toxicity - single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ systemic toxicity - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

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

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

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

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

Further information

After absorption:

Risk of methemoglobin formation with headache, cardiac dysrhythmia, drop in blood pressure, dyspnoea and spasms, principal symptom: cyanosis (blue discoloration of the blood).

Damage to:

Liver, Kidney

Effect potentiated by: ethanol

Under given conditions, contact with nitrites or nitric acid can lead to the formation of nitrosamines, which have shown themselves to be carcinogenic in animal experiments.

This substance should be handled with particular care.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 Pimephales promelas (fathead minnow): 0.06 mg/l; 96 h (IUCLID)

Toxicity to daphnia and other aquatic invertebrates

EC50 Tetrahymen pyriformis: 74 mg/l; 60 h (ECOTOX Database)

EC50 Daphnia magna (Water flea): 0.28 mg/l; 48 h (IUCLID)

Persistence and degradability

Biodegradability

ca. 30 %; 28 d

OECD Test Guideline 301D

Not readily biodegradable.

Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: -0.30

(experimental)

(Lit.) Bioaccumulation is not expected (log Pow <1).

Mobility in soil

No information available.

Additional ecological information

Biological effects:

Forms toxic mixtures in water, dilution measures notwithstanding.

Further information on ecology

Discharge into the environment must be avoided.

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SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

| | |
|---------------------------|-------------------|
| UN number | UN 1673 |
| Proper shipping name | PHENYLENEDIAMINES |
| Class | 6.1 |
| Packing group | III |
| Environmentally hazardous | -- |

Air transport (IATA)

| | |
|------------------------------|-------------------|
| UN number | UN 1673 |
| Proper shipping name | PHENYLENEDIAMINES |
| Class | 6.1 |
| Packing group | III |
| Environmentally hazardous | -- |
| Special precautions for user | no |

Sea transport (IMDG)

| | |
|------------------------------|-------------------|
| UN number | UN 1673 |
| Proper shipping name | PHENYLENEDIAMINES |
| Class | 6.1 |
| Packing group | III |
| Environmentally hazardous | -- |
| Special precautions for user | yes |
| EmS | F-A S-A |

SECTION 15. Regulatory information

United States of America

OSHA Hazards

Toxic by inhalation.

Toxic by ingestion

Eye irritant

Skin sensitizer

Target organ effects

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

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Product number

807246

Version 1.1

Product name

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SARA 311/312 Hazards

Acute Health Hazard

Chronic Health Hazard

SARA 313

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

Ingredients

p-phenylenediamine

106-50-3

SARA 302

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

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

DEA List I

Not listed

DEA List II

Not listed

US State Regulations

Massachusetts Right To Know

Ingredients

p-phenylenediamine

Pennsylvania Right To Know

Ingredients

p-phenylenediamine

New Jersey Right To Know

Ingredients

p-phenylenediamine

California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

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Notification status

TSCA: All components of the product are listed in the TSCA-inventory.

DSL: All components of this product are on the Canadian DSL.

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

Full text of H-Statements referred to under sections 2 and 3.

| | |
|------|---|
| H301 | Toxic if swallowed. |
| H311 | Toxic in contact with skin. |
| H317 | May cause an allergic skin reaction. |
| H319 | Causes serious eye irritation. |
| H331 | Toxic if inhaled. |
| H400 | Very toxic to aquatic life. |
| H410 | Very toxic to aquatic life with long lasting effects. |

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Revision Date 08/15/2013

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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