SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

<table>
<thead>
<tr>
<th>Product name</th>
<th>o-Phenylenediamine dihydrochloride</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Number</td>
<td>P8287</td>
</tr>
<tr>
<td>Brand</td>
<td>Sigma</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>615-28-1</td>
</tr>
</tbody>
</table>

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

Identified uses: Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company: Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone: +1 314 771-5765
Fax: +1 800 325-5052

1.4 Emergency telephone

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

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

- Acute toxicity, Oral (Category 4), H302
- Acute toxicity, Inhalation (Category 4), H332
- Eye irritation (Category 2A), H319
- Skin sensitization (Category 1), H317
- Germ cell mutagenicity (Category 2), H341
- Carcinogenicity (Category 2), H351
- Short-term (acute) aquatic hazard (Category 1), H400
- Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.
2.2 **GHS Label elements, including precautionary statements**

**Pictogram**

[Image of pictogram]

**Signal Word**

**Warning**

**Hazard Statements**

- **H302 + H332** Harmful if swallowed 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.
- **H410** Very toxic to aquatic life with long lasting effects.

**Precautionary Statements**

- **P201** Obtain special instructions before use.
- **P202** Do not handle until all safety precautions have been read and understood.
- **P261** Avoid breathing dust.
- **P264** Wash skin thoroughly after handling.
- **P270** Do not eat, drink or smoke when using this product.
- **P271** Use only outdoors or in a well-ventilated area.
- **P272** Contaminated work clothing must not be allowed out of the workplace.
- **P273** Avoid release to the environment.
- **P280** Wear protective gloves/ protective clothing/ eye protection/ face protection.
- **P301 + P312 + P330** IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
- **P302 + P352** IF ON SKIN: Wash with plenty of soap and water.
- **P304 + P340 + P312** IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
- **P305 + P351 + P338** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- **P308 + P313** IF exposed or concerned: Get medical advice/ attention.
- **P333 + P313** If skin irritation or rash occurs: Get medical advice/ attention.
- **P337 + P313** If eye irritation persists: Get medical advice/ attention.
- **P363** Wash contaminated clothing before reuse.
- **P391** Collect spillage.
- **P405** Store locked up.
- **P501** Dispose of contents/ container to an approved waste disposal plant.

2.3 **Hazards not otherwise classified (HNOC) or not covered by GHS** - none

---

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

3.2 **Mixtures**

**Formula**: \( C_6H_8N_2 \cdot 2HCl \)

**Molecular weight**: 181.06 g/mol

Sigma - P8287

---

The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada
### Component Classification Concentration

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1,2-phenylenediamine dihydrochloride</strong></td>
<td>Acute Tox. 3; Acute Tox. 4; Eye Irrit. 2A; Skin Sens. 1; Muta. 2; Carc. 2; Aquatic Acute 1; Aquatic Chronic 1; H301, H332, H312, H319, H317, H341, H351, H400, H410</td>
<td>&gt;= 30 - &lt; 50 %</td>
</tr>
<tr>
<td>CAS-No. 615-28-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC-No. 210-418-7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index-No. 612-146-00-8</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>sodium hydrogensulphite</strong></td>
<td>Acute Tox. 4; Eye Irrit. 2A; Aquatic Acute 3; H302, H319, H402</td>
<td>&gt;= 1 - &lt; 5 %</td>
</tr>
<tr>
<td>CAS-No. 7631-90-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC-No. 231-548-0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index-No. 016-064-00-8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**SECTION 4: First aid measures**

### 4.1 Description of first-aid measures

**General advice**
Show this material safety data sheet to the doctor in attendance.

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

**In case of skin contact**
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Consult a physician.

**In case of eye contact**
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

**If swallowed**
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

### 4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

### 4.3 Indication of any immediate medical attention and special treatment needed
No data available
SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

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

5.2 Special hazards arising from the substance or mixture

Carbon oxides
Nitrogen oxides (NOx)
Hydrogen chloride gas
Carbon oxides
Nitrogen oxides (NOx)
Sulfur oxides
Hydrogen chloride gas
Sodium oxides
Combustible.

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

5.3 Advice for firefighters

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

5.4 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

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 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 dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections

For disposal see section 13.
SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

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

Storage stability
Recommended storage temperature 2 - 8 °C

Storage class
Storage class (TRGS 510): 6.1C: Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>sodium hydrogensulphite</td>
<td>7631-90-5</td>
<td>TWA</td>
<td>5 mg/m3</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

Remarks: Not classifiable as a human carcinogen

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>5 mg/m3</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PEL</td>
<td>5 mg/m3</td>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
**Personal protective equipment**

**Eye/face protection**
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

**Skin 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.

- **Full contact**
  - Material: Nitrile rubber
  - Minimum layer thickness: 0.11 mm
  - Break through time: 480 min
  - Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

- **Splash contact**
  - Material: Nitrile rubber
  - Minimum layer thickness: 0.11 mm
  - Break through time: 480 min
  - Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

  data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Body Protection**
protective clothing

**Respiratory protection**
Recommended Filter type: Filter type P3

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

**Control of environmental exposure**
Do not let product enter drains.

---

**SECTION 9: Physical and chemical properties**

**9.1 Information on basic physical and chemical properties**

a) **Appearance**
   - Form: tablet
<table>
<thead>
<tr>
<th>Property</th>
<th>Data Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) Odor</td>
<td>No data available</td>
</tr>
<tr>
<td>c) Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>d) pH</td>
<td>No data available</td>
</tr>
<tr>
<td>e) Melting point/freezing point</td>
<td>Melting point/range: 258 °C (496 °F) - dec.</td>
</tr>
<tr>
<td>f) Initial boiling point and boiling range</td>
<td>No data available</td>
</tr>
<tr>
<td>g) Flash point</td>
<td>() No data available</td>
</tr>
<tr>
<td>h) Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>i) Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>j) Upper/lower flammability or explosive limits</td>
<td>No data available</td>
</tr>
<tr>
<td>k) Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>l) Vapor density</td>
<td>No data available</td>
</tr>
<tr>
<td>m) Density</td>
<td>No data available</td>
</tr>
<tr>
<td>n) Water solubility</td>
<td>No data available</td>
</tr>
<tr>
<td>o) Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>p) Autoignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>q) Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>r) Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>s) Explosive properties</td>
<td>Not classified as explosive.</td>
</tr>
<tr>
<td>t) Oxidizing properties</td>
<td>none</td>
</tr>
</tbody>
</table>

9.2 **Other safety information**
No data available

---

**SECTION 10: Stability and reactivity**

10.1 **Reactivity**
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.

10.2 **Chemical stability**
The product is chemically stable under standard ambient conditions (room temperature) .
10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Mixture

Acute toxicity
Oral: No data available

Inhalation: No data available
Acute toxicity estimate Inhalation - 4 h - 3.23 mg/l - dust/mist (Calculation method)

Symptoms: Possible symptoms:, mucosal irritations
Dermal: No data available
Acute toxicity estimate Dermal - 3,471 mg/kg
(Calculation method)

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
Remarks: Mixture causes serious eye irritation.

Respiratory or skin sensitization
Mixture may cause an allergic skin reaction.

Germ cell mutagenicity
Evidence of genetic defects.

Carcinogenicity
Evidence of a carcinogenic effect.

IARC: 2B - Group 2B: Possibly carcinogenic to humans (1,2-phenylenediamine dihydrochloride)

NTP: 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.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
**Specific target organ toxicity - single exposure**
No data available

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
No data available

**11.2 Additional Information**

Other dangerous properties can not be excluded.

This substance should be handled with particular care.

Handle in accordance with good industrial hygiene and safety practice.

Liver - Irregularities - Based on Human Evidence

**Components**

1,2-phenylenediamine dihydrochloride

**Acute toxicity**
Oral: No data available
Inhalation: No data available
Dermal: No data available
No data available

**Skin corrosion/irritation**
No data available

**Serious eye damage/eye irritation**
Remarks: No data available

**Respiratory or skin sensitization**
No data available

**Germ cell mutagenicity**
In vitro tests showed mutagenic effects Suspected of causing genetic defects.

**Carcinogenicity**
Suspected human carcinogens Suspected of causing cancer.

**Reproductive toxicity**
No data available

**Specific target organ toxicity - single exposure**
No data available

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
No data available
sodium hydrogensulphite

**Acute toxicity**
LD50 Oral - Rat - male and female - 1,540 mg/kg  
(OECD Test Guideline 401)
LC50 Inhalation - Rat - male and female - 4 h - > 5.5 mg/l - dust/mist  
(OECD Test Guideline 403)
Remarks: (ECHA)
The value is given in analogy to the following substances: sodium sulphite
LD50 Dermal - Rat - male and female - > 2,000 mg/kg  
(OECD Test Guideline 402)
Remarks: (ECHA)
The value is given in analogy to the following substances: sodium sulphite
No data available

**Skin corrosion/irritation**
Skin - Rabbit
Result: No skin irritation  
(OECD Test Guideline 404)
Remarks: (in analogy to similar products)

**Serious eye damage/eye irritation**
Remarks: Causes serious eye irritation.  
(in analogy to similar products)

**Respiratory or skin sensitization**
Local lymph node assay (LLNA) - Mouse
Result: negative  
(OECD Test Guideline 429)
Remarks: (ECHA)
The value is given in analogy to the following substances: sodium sulphite

**Germ cell mutagenicity**
Species: Rat - male
Result: negative
Remarks: (ECHA)

**Carcinogenicity**
Carcinogenicity classification not possible from current data.

**Reproductive toxicity**
Weight of evidence does not support classification for reproductive toxicity

**Specific target organ toxicity - single exposure**
No data available

**Specific target organ toxicity - repeated exposure**

**Aspiration hazard**
No data available
SECTION 12: Ecological information

12.1 Toxicity

**Mixture**
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

**Components**

1,2-phenylenediamine dihydrochloride
No data available

**sodium hydrogensulphite**

Toxicity to fish
static test LC50 - Leuciscus idus (Golden orfe) - > 215 - < 464 mg/l - 96 h
Remarks: (ECHA)
The value is given in analogy to the following substances: potassium sulfite

Toxicity to daphnia and other aquatic invertebrates
static test EC50 - Daphnia magna (Water flea) - 89 mg/l - 48 h
Remarks: (ECHA)
The value is given in analogy to the following substances: sodium metabisulphite

Toxicity to algae
static test ErC50 - Desmodesmus subspicatus (green algae) - 43.8 mg/l - 72 h
(OECD Test Guideline 201)
Remarks: (ECHA)
The value is given in analogy to the following substances: sodium metabisulphite

Toxicity to bacteria
static test EC50 - activated sludge - > 1,000 mg/l - 3 h
(OECD Test Guideline 209)
Remarks: (ECHA)
The value is given in analogy to the following substances: sodium sulphite

Toxicity to fish (Chronic toxicity)
flow-through test NOEC - Danio rerio (zebra fish) - >= 316 mg/l - 34 d
(OECD Test Guideline 210)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)
semi-static test NOEC - Daphnia magna (Water flea) - > 10 mg/l - 21 d
(OECD Test Guideline 211)

SECTION 13: Disposal considerations

13.1 Waste treatment methods

**Product**
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

**DOT (US)**
UN number: 1673  Class: 6.1  Packing group: III
Proper shipping name: Phenylenediamines
Reportable Quantity (RQ): 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: yes

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

SECTION 15: Regulatory information

**SARA 302 Components**
This material does not contain any components with a section 302 EHS TPQ.

**SARA 313 Components**

The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2-phenylenediamine dihydrochloride</td>
<td>615-28-1</td>
<td>2022-03-07</td>
</tr>
</tbody>
</table>

**SARA 311/312 Hazards**
Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>sodium hydrogensulphite</td>
<td>7631-90-5</td>
<td>2007-03-01</td>
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</tbody>
</table>

**Pennsylvania Right To Know Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
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</thead>
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<tr>
<td>sodium hydrogensulphite</td>
<td>7631-90-5</td>
<td>2007-03-01</td>
</tr>
</tbody>
</table>

**California Prop. 65 Components**

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<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
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<tbody>
<tr>
<td>1,2-phenylenediamine dihydrochloride</td>
<td>615-28-1</td>
<td>2007-09-28</td>
</tr>
</tbody>
</table>

### SECTION 16: Other information

**Further information**
The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.15 Revision Date: 12/22/2023 Print Date: 01/14/2024