**1. PRODUCT AND COMPANY IDENTIFICATION**

- **Product name**: 1,10-Phenanthonline monohydrate
- **Product Number**: PS755
- **Brand**: Sigma-Aldrich
- **Supplier**: Sigma-Aldrich
  - 3850 Spruce Street
  - SAINT LOUIS MO 63103
  - USA
- **Telephone**: +1 800-325-5832
- **Fax**: +1 800-325-5052
- **Emergency Phone # (For both supplier and manufacture)**: (314) 776-6555
- **Preparation Information**: Sigma-Aldrich Corporation
  - Product Safety - Americas Region
  - 1-800-521-8856

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**2. HAZARDS IDENTIFICATION**

**OSHA Hazards**
- **Toxic by ingestion**

**GHS Classification**
- Acute toxicity, Oral (Category 3)
- Acute aquatic toxicity (Category 1)

**GHS Label elements, including precautionary statements**
- **Signal word**: Danger
- **Hazard statement(s)**
  - H301: Toxic if swallowed.
  - H400: Very toxic to aquatic life.
- **Precautionary statement(s)**
  - P273: Avoid release to the environment.
  - P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

**HMIS Classification**
- **Health hazard**: 2
- **Flammability**: 0
- **Physical hazards**: 0

**NFPA Rating**
- **Health hazard**: 2
- **Fire**: 0
- **Reactivity Hazard**: 0

**Potential Health Effects**
- **Inhalation**: May be harmful if inhaled. May cause respiratory tract irritation.

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**3. COMPOSITION/INFORMATION ON INGREDIENTS**

- **Synonyms**: o-Phenanthonline monohydrate
- **Formula**: C_{13}H_{18}O_{4}·H_{2}O
- **Molecular Weight**: 198.25 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration</th>
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<tbody>
<tr>
<td>o-Phenanthonline hydrate</td>
<td></td>
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<tr>
<td>CAS-No.</td>
<td>5144-89-8</td>
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<tr>
<td>EC-No.</td>
<td>200-829-2</td>
</tr>
<tr>
<td>Index-No.</td>
<td>013-592-03-9</td>
</tr>
</tbody>
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**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 breathless, 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.

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

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**5. FIREFIGHTING 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 firefighters**
- 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)

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**6. ACCIDENTAL RELEASE MEASURES**

**Personal precautions**
- Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, 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.

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**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.

Hygroscopic. Store under inert gas. Keep in a dry place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

**Personal protective equipment**

**Respiratory protection**
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N99 (US) or type P2 (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**
Hand 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: Dermamin® (KCL 740 / Aldrich Z077272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: Dermamin® (KCL 740 / Aldrich Z077272, Size M)

data source: KCL GmbH, D-36129 Einbeck, phone +49 (0)6658 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 CE 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.

**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 powder
Colour white

**Safety data**
pH no data available
Melting point/range 100 - 104 °C (212 - 219 °F) - lit.
Boiling point no data available

**Flash point** not applicable
**Ignition temperature** no data available
**Auto-ignition temperature** no data available
**Lower explosion limit** no data available
**Upper explosion limit** no data available
**Vapour pressure** no data available
**Density** no data available
**Water solubility** soluble
**Partition coefficient**: n-octanol/Water no data available
**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**
Exposure to moisture.

**Materials to avoid**
Acids, 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 - 132 mg/kg

**Inhalation LC50**
no data available

**Dermal LD50**
no data available

**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 sensitisation**
no data available

**Germ cell mutagenicity**
no data available

Carcinogenicity
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.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
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)
no data available

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

Aspiration hazard
no data available

Potential health effects
Inhalation May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion Toxic if swallowed.
Skin May be harmful if absorbed through skin. May cause skin irritation.
Eyes May cause eye irritation.

Synergistic effects
no data available

Additional Information
RTECS: SF8437000

12. ECOLOGICAL INFORMATION
Toxicity
no data available

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.

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 unusable product.

14. TRANSPORT INFORMATION
DOT (US)
UN number: 2811 Class: 6.1 Packing group: III Proper shipping name: Toxic solids, organic, n.o.s. (o-Phenanthroline hydrate)
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 2811 Class: 6.1 Packing group: III EMS-No: F-A, S-A Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (o-Phenanthroline hydrate)
Marine pollutant: No

IATA
UN number: 2811 Class: 6.1 Packing group: III Proper shipping name: Toxic solid, organic, n.o.s. (o-Phenanthroline hydrate)

15. REGULATORY INFORMATION
OSHA Hazards
Toxic by ingestion

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
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components
o-Phenanthroline hydrate CAS-No. 5144-69-8

New Jersey Right To Know Components
o-Phenanthroline hydrate CAS-No. 5144-69-8

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION
Further Information
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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 applicative to the product with regard to appropriate safety precautions. 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.