SECTION 1: Identification

1.1. Identification

Product form : Substance
Substance name : 1,10-Phenanthroline, Monohydrate, ACS
CAS No : 5144-89-8
Product code : LC18140
Formula : C12H8N2.H2O
Synonyms : 4,5-phenanthroline monohydrate / o-phenanthroline monohydrate / ortho-phenanthroline monohydrate

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

Use of the substance/mixture : Laboratory chemical

1.3. Details of the supplier of the safety data sheet

LabChem Inc
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court
Zelienople, PA 16063 - USA
T 412-826-5230 - F 724-473-0647
info@labchem.com - www.labchem.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 or 011-703-527-3887

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification
Acute toxicity (oral) Category 3 H301
Hazardous to the aquatic environment - Acute Hazard Category 1 H400
Hazardous to the aquatic environment - Chronic Hazard Category 1 H410

Full text of H statements : see section 16

2.2. Label elements

GHS-US labeling
Hazard pictograms (GHS-US) :

Signal word (GHS-US) : Danger
Hazard statements (GHS-US) : H301 - Toxic if swallowed
H410 - Very toxic to aquatic life with long lasting effects
Precautionary statements (GHS-US) : P264 - Wash exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P273 - Avoid release to the environment
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P330 - If swallowed, rinse mouth
P391 - Collect spillage
P405 - Store locked up
P501 - Dispose of contents/container to comply with local, state and federal regulations

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

Not applicable
**SECTION 3: Composition/Information on ingredients**

### 3.1. Substance

**Substance type:** Mono-constituent

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,10-Phenanthroline, Monohydrate, ACS</td>
<td>(CAS No) 5144-89-8</td>
<td>100</td>
<td>Acute Tox. 3 (Oral), H301</td>
</tr>
<tr>
<td>(Main constituent)</td>
<td></td>
<td></td>
<td>Aquatic Acute 1, H400</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aquatic Chronic 1, H410</td>
</tr>
</tbody>
</table>

Full text of hazard classes and H-statements: see section 16

### 3.2. Mixture

Not applicable

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**SECTION 4: First aid measures**

### 4.1. Description of first aid measures


**First-aid measures after inhalation:** Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

**First-aid measures after skin contact:** Rinse with water. Soap may be used. Take victim to a doctor if irritation persists.

**First-aid measures after eye contact:** Rinse with water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

**First-aid measures after ingestion:** Rinse mouth with water. Give nothing to drink. Victim is fully conscious: immediately induce vomiting. Induce vomiting by giving a 0.9 % saline solution. Call Poison Information Centre (www.big.be/antigif.htm). Immediately consult a doctor/medical service. Ingestion of large quantities: immediately to hospital. Take the container/vomit to the doctor/hospital. Doctor: administration of chemical antidote. Doctor: gastric lavage.

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/injuries after inhalation:** Slight irritation.

**Symptoms/injuries after skin contact:** Slight irritation.

**Symptoms/injuries after eye contact:** Slight irritation.


### 4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

---

**SECTION 5: Firefighting measures**

### 5.1. Extinguishing media

**Suitable extinguishing media:** Water spray. Polyvalent foam. Alcohol-resistant foam. Polymer foam. ABC powder. Carbon dioxide.

**Unsuitable extinguishing media:** No unsuitable extinguishing media known.

### 5.2. Special hazards arising from the substance or mixture

**Fire hazard:** DIRECT FIRE HAZARD. Not easily combustible. In finely divided state: increased fire hazard. INDIRECT FIRE HAZARD. Heating increases the fire hazard.

**Explosion hazard:** DIRECT EXPLOSION HAZARD. Fine dust is explosive with air. INDIRECT EXPLOSION HAZARD. Dust cloud can be ignited by a spark.

**Reactivity:** On burning: release of toxic and corrosive gases/vapours (nitrous vapours, carbon monoxide - carbon dioxide).

### 5.3. Advice for firefighters

**Precautionary measures fire:** Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: have neighbourhood close doors and windows.

**Firefighting instructions:** Dilute toxic gases with water spray. Take account of toxic fire-fighting water. Use water moderately and if possible collect or contain it.

**Protection during firefighting:** Heat/fire exposure: compressed air/oxygen apparatus.
**1,10-Phenanthroline, Monohydrate, ACS**

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

##### 6.1.1. For non-emergency personnel


**Emergency procedures**: Mark the danger area. Prevent dust cloud formation, e.g. by wetting. No naked flames. Wash contaminated clothes.


##### 6.1.2. For emergency responders

**Protective equipment**: Do not breathe dust. Equip cleanup crew with proper protection.

**Emergency procedures**: Stop release. Ventilate area.

#### 6.2. Environmental precautions

Prevent soil and water pollution. Prevent spreading in sewers.

#### 6.3. Methods and material for containment and cleaning up

For containment: Contain released substance, pump into suitable containers. Consult "Material-handling" to select material of containers. Plug the leak, cut off the supply. Dam up the solid spill. Knock down/dilute dust cloud with water spray. Take account of toxic/corrosive precipitation water. Powdered form: no compressed air for pumping over spills.


#### 6.4. Reference to other sections

No additional information available

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

**Additional hazards when processed**: Pulverization rapidly increases toxic concentration.


**Hygiene measures**: Do not eat, drink or smoke when using this product. Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

#### 7.2. Conditions for safe storage, including any incompatibilities

**Incompatible products**: Strong acids. Strong oxidizers.


**Heat-ignition**: KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.

**Prohibitions on mixed storage**: KEEP SUBSTANCE AWAY FROM: oxidizing agents. strong acids. metals.

**Storage area**: Store in a dry area. Store at ambient temperature. Keep container in a well-ventilated place. Keep locked up. Meet the legal requirements.

**Special rules on packaging**: SPECIAL REQUIREMENTS: hermetical. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.

**Packaging materials**: SUITABLE MATERIAL: plastics. glass. MATERIAL TO AVOID: iron.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

No additional information available
### 8.2. Exposure controls

**Appropriate engineering controls:**
Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Provide adequate general and local exhaust ventilation.

**Personal protective equipment:**

**Materials for protective clothing:**
GIVE GOOD RESISTANCE: synthetic material. rubber.

**Hand protection:**
Gloves.

**Eye protection:**
Safety glasses. In case of dust production: protective goggles.

**Skin and body protection:**
Protective clothing. In case of dust production: dustproof clothing.

**Respiratory protection:**

### SECTION 9: Physical and chemical properties

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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Solid</td>
</tr>
<tr>
<td>Color</td>
<td>White On exposure to air: turns dark</td>
</tr>
<tr>
<td>Odor</td>
<td>Mild odour</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>93 °C</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate</td>
<td>0</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>6.2</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.1</td>
</tr>
<tr>
<td>Specific gravity / density</td>
<td>1100 kg/m³</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>198.22 g/mol</td>
</tr>
<tr>
<td>Solubility</td>
<td>Moderately soluble in water. Soluble in ethanol. Soluble in acetone. Water: 3 g/100ml</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
</tbody>
</table>

**9.2. Other information**

**VOC content:**
0 %

### SECTION 10: Stability and reactivity

**10.1. Reactivity**
On burning: release of toxic and corrosive gases/vapours (nitrous vapours, carbon monoxide - carbon dioxide).

**10.2. Chemical stability**
Discolours on exposure to air.
10.3. Possibility of hazardous reactions
Not established.

10.4. Conditions to avoid

10.5. Incompatible materials
Strong oxidizers. Strong acids.

10.6. Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure: Inhalation; Skin and eye contact
Acute toxicity: Oral: Toxic if swallowed.

<table>
<thead>
<tr>
<th>1,10-Phenanthroline, Monohydrate, ACS (5144-89-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
</tr>
<tr>
<td>ATE US (oral)</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation: Not classified
Serious eye damage/irritation: Not classified
Respiratory or skin sensitization: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified
Reproductive toxicity: Not classified
Specific target organ toxicity (single exposure): Not classified
Specific target organ toxicity (repeated exposure): Not classified
Aspiration hazard: Not classified
Symptoms/injuries after inhalation: Slight irritation.
Symptoms/injuries after skin contact: Slight irritation.
Symptoms/injuries after eye contact: Slight irritation.

SECTION 12: Ecological information

12.1. Toxicity
Ecology - general: Dangerous for the environment.
Ecology - air: Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).
Ecology - water: Severe water pollutant (surface water). Highly toxic to aquatic organisms. Nitrification of activated sludge is inhibited.

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>1,10-Phenanthroline, Monohydrate, ACS (5144-89-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioaccumulative potential</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil
No additional information available

12.5. Other adverse effects
No additional information available
SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations: Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Dissolve or mix with a combustible solvent. Remove to an authorized incinerator equipped with an afterburner and a flue gas scrubber with energy recovery.

Additional information: Hazardous waste according to Directive 2008/98/EC.

Ecology - waste materials: Avoid release to the environment.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description: UN2811 Toxic solids, organic, n.o.s., 6.1, III

UN-No. (DOT): UN2811

Proper Shipping Name (DOT): Toxic solids, organic, n.o.s.


Packing group (DOT): III - Minor Danger

Hazard labels (DOT): 6.1 - Poison inhalation hazard

DOT Packaging Non Bulk (49 CFR 173.xxx): 213

DOT Packaging Bulk (49 CFR 173.xxx): 240

DOT Symbols: G - Identifies PSN requiring a technical name

DOT Special Provisions (49 CFR 172.102): IB8 - Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2)

IP3 - Flexible IBCs must be sift-proof and water-resistant or must be fitted with a sift-proof and water-resistant liner

T1 - 1.5 178.274(d)(2) Normal.............. 178.275(d)(2)

TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter

DOT Packaging Exceptions (49 CFR 173.xxx): 153

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27): 100 kg

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75): 200 kg
1,10-Phenanthroline, Monohydrate, ACS
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DOT Vessel Stowage Location: A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel
Other information: No supplementary information available.

SECTION 15: Regulatory information

15.1. US Federal regulations

1,10-Phenanthroline, Monohydrate, ACS (5144-89-8)
Not listed on the United States TSCA (Toxic Substances Control Act) inventory

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA

1,10-Phenanthroline, Monohydrate, ACS (5144-89-8)
WHMIS Classification: Class D Division 1 Subdivision B - Toxic material causing immediate and serious toxic effects

EU-Regulations
No additional information available

National regulations
No additional information available

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

Revision date: 09/02/2016

Full text of H-phrases: see section 16:

<table>
<thead>
<tr>
<th>H</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>H301</td>
<td>Toxic if swallowed</td>
</tr>
<tr>
<td>H400</td>
<td>Very toxic to aquatic life</td>
</tr>
<tr>
<td>H410</td>
<td>Very toxic to aquatic life with long lasting effects</td>
</tr>
</tbody>
</table>

NFPA health hazard: 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard: 1 - Must be preheated before ignition can occur.

NFPA reactivity: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

HMIS III Rating

Health: 2 Moderate Hazard - Temporary or minor injury may occur
Flammability: 1 Slight Hazard - Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 F. (Class III B)
Physical: 1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.

Personal protection: E - Safety glasses, Gloves, Dust respirator

SDS US LabChem

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