

## SAFETY DATA SHEET

Preparation Date: 08/14/2015

Revision date 04/18/2019

Revision Number: G2

### 1. IDENTIFICATION

#### Product identifier

**Product code:** P1055  
**Product Name:** 1,10-PHENANTHROLINE, MONOHYDRATE, REAGENT, ACS

#### Other means of identification

**Synonyms:** 4,5-Phenanthroline monohydrate  
 1,10-Phenanthroline, monohydrate  
 1,10-o-Phenanthroline monohydrate  
 1,10-Phenanthroline monohydrate  
 4,5-Diazaphenanthrene monohydrate  
 beta-Phenanthroline monohydrate  
 Orthophenanthroline monohydrate

**CAS #:** 5144-89-8  
**RTECS #** SF8437000  
**CI#:** Not available

#### Recommended use of the chemical and restrictions on use

**Recommended use:** No information available.  
**Uses advised against** No information available

**Supplier:** Spectrum Chemical Mfg. Corp  
 14422 South San Pedro St.  
 Gardena, CA 90248  
 (310) 516-8000

**Order Online At:** <https://www.spectrumchemical.com>  
**Emergency telephone number** Chemtrec 1-800-424-9300  
**Contact Person:** Tom Tyner (USA - West Coast)  
**Contact Person:** Ibad Tirmiz (USA - East Coast)

### 2. HAZARDS IDENTIFICATION

#### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Acute toxicity - Oral	Category 3
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#### Label elements

**Danger**

**Hazard statements**  
 Toxic if swallowed

**Product code:** P1055

**Product name:**  
 1,10-PHENANTHROLINE,  
 MONOHYDRATE, REAGENT, ACS

**Page** 1 / 12



**Hazards not otherwise classified (HNOC)**

Not Applicable

**Other hazards**

Not available

**Precautionary Statements - Prevention**

Wash face, hands and any exposed skin thoroughly after handling  
Do not eat, drink or smoke when using this product

**Precautionary Statements - Response**

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician  
Rinse mouth

**Precautionary Statements - Storage**

Store locked up

**Precautionary Statements - Disposal**

Dispose of contents and container to an approved waste disposal plant in accordance with local, regional, national and international regulations as applicable

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Component	CAS No	Weight-%
1,10-Phenanthroline, Monohydrate	5144-89-8	100

**4. FIRST AID MEASURES**

**First aid measures**

**General Advice:**

National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. First aider needs to protect himself.

**Skin Contact:**

Wash off immediately with soap and plenty of water removing all contaminated clothing and shoes. Get medical attention if irritation develops. Consult a physician if necessary.

**Eye Contact:**

Flush eyes with water for 15 minutes. Get medical attention if irritation occurs. If symptoms persist, call a physician.

**Inhalation:**

Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is

required.

**Ingestion:** Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Immediate medical attention is required.

**Most important symptoms and effects, both acute and delayed**

**Symptoms** Toxic if swallowed  
May cause skin irritation  
May cause eye irritation

**Indication of any immediate medical attention and special treatment needed**

**Notes to Physician:** Treat symptomatically.

**Protection of first-aiders**

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

**5. FIRE-FIGHTING MEASURES**

**Extinguishing Media**

**Suitable Extinguishing Media:** Dry chemical. Carbon dioxide (CO<sub>2</sub>). Water spray. Foam.

**Unsuitable Extinguishing Media:** No information available.

**Specific hazards arising from the chemical**

**Hazardous combustion products** Carbon monoxide. Carbon dioxide (CO<sub>2</sub>). Nitrogen oxides (NO<sub>x</sub>).

**Specific hazards** May be combustible at high temperatures.

**Special Protective Actions for Firefighters**

**Specific Methods:** No information available

**Special Protective Equipment for Firefighters:** As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

**Personal Precautions:** Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Remove all sources of ignition. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

**Environmental precautions** Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Prevent entry into waterways, sewers, basements or confined areas.

### Methods and material for containment and cleaning up

**Methods for containment** Stop leak if you can do it without risk. Cover with plastic sheet to prevent spreading.

**Methods for cleaning up** Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

#### **Technical Measures/Precautions:**

Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. Keep away from incompatible materials.

#### **Safe Handling Advice**

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not ingest. Do not breathe dust. Keep away from heat and sources of ignition. Handle in accordance with good industrial hygiene and safety practice.

### Conditions for safe storage, including any incompatibilities

#### **Technical Measures/Storage Conditions:**

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Store away from incompatible materials. Store in a segregated and approved area.

#### **Incompatible Materials:**

Strong oxidizing agents  
Strong acids

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control parameters

### **National occupational exposure limits**

#### **United States**

Component	CAS No	OSHA	NIOSH	ACGIH	AIHA WEEL
1,10-Phenanthroline, Monohydrate	5144-89-8	None	None	None	None

#### **Canada**

Component	CAS No	Canada - Alberta	Canada - British Columbia	Canada - Ontario	Canada - Quebec
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**Product code:** P1055

**Product name:**  
1,10-PHENANTHROLINE,  
MONOHYDRATE, REAGENT, ACS

**Page** 4 / 12

1,10-Phenanthroline, Monohydrate	5144-89-8	None	None	None	None
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### Australia and Mexico

Component	CAS No	Australia	Mexico
1,10-Phenanthroline, Monohydrate	5144-89-8	None	None

### Appropriate engineering controls

**Engineering measures to reduce exposure:** Ensure adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

### Individual protection measures, such as personal protective equipment

#### Personal Protective Equipment

**Eye protection:** Goggles or Safety glasses with side-shields.

**Skin and body protection:** Long sleeved clothing  
Chemical resistant apron  
Gloves

**Respiratory protection:** Wear respirator with dust filter. Be sure to use an approved/certified respirator or equivalent.

**Hygiene measures:** Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state:</b> Solid	<b>Appearance:</b> Powder.	<b>Color:</b> White. Off-white.
<b>Odor:</b> No information available.	<b>Taste</b> No information available.	<b>Formula</b> No information available
<b>Molecular/Formula weight (g/mole):</b> No information available	<b>Flammability (solid, gas)</b> no data available	<b>Flashpoint (°C/°F):</b> No information available
<b>Flash Point Tested according to:</b> Not available	<b>Autoignition Temperature (°C/°F):</b> No information available	<b>Lower Explosion Limit (%):</b> No information available
<b>Upper Explosion Limit (%):</b> No information available	<b>Melting point/range(°C/°F):</b> 97-102°C/ 207-216°F	<b>Decomposition temperature(°C/°F):</b> No information available
<b>Boiling point/range(°C/°F):</b> 94°C/ 201.2°F Decomposes	<b>Bulk density:</b> No information available	<b>Density (g/cm3):</b> No information available
<b>Specific gravity:</b> No information available	<b>pH</b> No information available	<b>Vapor pressure @ 20°C (kPa):</b> No information available

**Evaporation rate:**  
No information available

**Vapor density:**  
No information available

**VOC content (g/L):**  
No information available

**Odor threshold (ppm):**  
No information available

**Partition coefficient  
(n-octanol/water):**  
No information available

**Viscosity:**  
No information available

**Miscibility:**  
No information available

**Solubility:**  
Very slightly soluble in cold water

## 10. STABILITY AND REACTIVITY

### Reactivity

Reactive with oxidizing agents  
Reactive with strong acids

### Chemical stability

**Stability:** Stable under recommended storage conditions.

**Possibility of Hazardous Reactions:** Hazardous polymerization does not occur

**Conditions to avoid:** Heat. Ignition sources. Incompatible materials.

**Incompatible Materials:** Strong oxidizing agents  
Strong acids

**Hazardous decomposition products:** Carbon oxides. Nitrogen oxides (NO<sub>x</sub>).

### Other Information

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Corrosivity:** No information available

## 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

**Principal Routes of Exposure:**  
Skin. Eyes. Inhalation. Ingestion.

### Acute Toxicity

### Component Information

1,10-Phenanthroline, Monohydrate

CAS No 5144-89-8

**LD50/oral/rat** = 132 mg/kg Oral LD50 Rat  
**LD50/oral/mouse** = No information available  
**LD50/dermal/rabbit** = No information available  
**LD50/dermal/rat** = No information available  
**LC50/inhalation/rat** = No information available  
**LC50/inhalation/mouse** = No information available  
**Other LD50 or LC50 information** = No information available

**Product code:** P1055

**Product name:**  
1,10-PHENANTHROLINE,  
MONOHYDRATE, REAGENT, ACS

**Page** 6 / 12

## Product Information

### LD50/oral/rat =

Value - Acute Tox = 132 mg/kg

### LD50/oral/mouse =

Value - Acute Tox Oral = No information available

### LD50/dermal/rabbit

Value - Acute Tox = No information available

### LD50/dermal/rat

VALUE - Acute Tox Dermal = No information available

### LC50/inhalation/rat

VALUE-Vapor = No information available

VALUE-Gas = No information available

VALUE-Dust/Mist = No information available

### LC50/Inhalation/mouse

VALUE-Vapor = No information available

VALUE - Gas = No information available

VALUE - Dust/Mist = No information available

## Symptoms

**Skin Contact:** May cause skin irritation.

**Eye Contact:** May cause eye irritation.

**Inhalation** May cause respiratory tract irritation.

**Ingestion** Toxic if swallowed.

**Aspiration hazard** No information available.

## Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Chronic Toxicity** No information available.

**Sensitization:** No information available.

**Mutagenic Effects:** Mutagenic effects in mammalian somatic cells

**Carcinogenic effects:** Not considered carcinogenic.

Component	CAS No	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Notifiable Carcinogenic Substances	Australia - Prohibited Carcinogenic Substances
1,10-Phenanthroline, Monohydrate	5144-89-8	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

*ACGIH (American Conference of Governmental Industrial Hygienists)*

*IARC (International Agency for Research on Cancer)*

**Product code:** P1055

**Product name:**  
1,10-PHENANTHROLINE,  
MONOHYDRATE, REAGENT, ACS

**Page** 7 / 12

NTP (National Toxicology Program)

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

**Reproductive toxicity** No data is available

**Reproductive Effects:** No information available  
**Developmental Effects:** No information available  
**Teratogenic Effects:** No information available

**Specific Target Organ Toxicity**

**STOT - single exposure** No information available.  
**STOT - repeated exposure** No information available.  
**Target Organs:** No information available.

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

**Ecotoxicity effects:** No data available.

**Persistence and degradability:** No information available

**Bioaccumulative potential:** No information available.

**Mobility in soil** No information available  
**Other adverse effects** No information available.

**13. DISPOSAL CONSIDERATIONS**

**Disposal Methods**

**Waste from residues / unused products:**  
Waste must be disposed of in accordance with Federal, State and Local regulation.

**Contaminated packaging:**  
Empty containers should be taken for local recycling, recovery or waste disposal

Component	CAS No	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
1,10-Phenanthroline, Monohydrate	5144-89-8	None	None	None	None

**14. TRANSPORT INFORMATION**

**DOT**

**UN-No:** UN2811  
**Proper Shipping Name:** Toxic solids, organic, n.o.s.  
**Hazard Class** 6.1  
**Subsidiary Class** No information available  
**Packing group:** III

**Product code:** P1055

**Product name:**  
1,10-PHENANTHROLINE,  
MONOHYDRATE, REAGENT, ACS



**Emergency Response Guide 154****Number****Marine Pollutant****DOT RQ (lbs):****Special Provisions****Symbol(s):**

Severe Marine Pollutant

No information available

IB8, IP3, T1, TP33

[DOT]: (G) - Identifies proper shipping names for which one or more technical names of the hazardous material must be entered in parentheses, in association with the basic description.

**Description:**

UN2811, Toxic solids, organic, n.o.s. (1,10-Phenanthroline, Monohydrate), 6.1, III

**TDG (Canada)****UN-No:****Proper Shipping Name:****Hazard Class****Subsidiary Risk:****Packing Group:****Marine Pollutant****Description:**

UN2811

Toxic solid, organic, n.o.s.

6.1

No information available

III

No Information available

UN2811, Toxic solid, organic, n.o.s. (1,10-Phenanthroline, Monohydrate), 6.1, III

**ADR****UN Number****Proper Shipping Name:****Transport hazard class(es)****Packing group****Subsidiary Risk:****Special Provisions****Description:**

UN2811

Toxic solid, organic, n.o.s.

6.1

III

No information available

274, 614

UN2811, Toxic solid, organic, n.o.s. (1,10-Phenanthroline, Monohydrate), 6.1, III

**IMDG****UN-No:****Proper Shipping Name:****Hazard Class:****Subsidiary Risk:****Packing Group:****Marine Pollutant****EMS:****Special Provisions****Description**

UN2811

Toxic solids, organic, n.o.s.

6.1

No information available

III

No information available

F-A

223, 274

UN2811, Toxic solid, organic, n.o.s. (1,10-Phenanthroline, Monohydrate), 6.1, III

**RID****UN Number****Proper Shipping Name:****Transport hazard class(es)****Subsidiary Risk:****Packing group****Special Provisions****Description:**

UN2811

Toxic solid, organic, n.o.s.

6.1

No information available

III

274, 614

UN2811, Toxic solid, organic, n.o.s. (1,10-Phenanthroline, Monohydrate), 6.1, III

**ICAO (air)****UN-No:****Proper Shipping Name:****Hazard Class****Subsidiary Risk:****Packing Group:****Description:****Special Provisions**

UN2811

Toxic solid, organic, n.o.s.

6.1

No information available

III

UN2811, Toxic solid, organic, n.o.s. (1,10-Phenanthroline, Monohydrate), 6.1, III

A3, A5

**IATA**

**UN Number** UN2811  
**Proper Shipping Name:** Toxic solid, organic, n.o.s.  
**Transport hazard class(es)** 6.1  
**Subsidiary Risk:** No information available  
**Packing group** III  
**Precautionary Statements - Response** 6L  
**Special Provisions** No information available  
**Description:** UN2811, Toxic solid, organic, n.o.s. (1,10-Phenanthroline, Monohydrate), 6.1, III

<b>15. REGULATORY INFORMATION</b>
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**International Inventories**

Component	CAS No	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	China IECSC	Australia (AICS)	EINECS-No.
1,10-Phenanthroline, Monohydrate	5144-89-8	Not Listed	Not present	Present	Present (5)-3915	Present	Present	Not present

**U.S. Regulations****California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.****Chemicals Known to the State of California to Cause Cancer:**

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

**Chemicals Known to the State of California to Cause Reproductive Toxicity:**

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Component	CAS No	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
1,10-Phenanthroline, Monohydrate	5144-89-8	Not Listed	Not Listed	Not Listed	Not Listed

**CERCLA/SARA**

Component	CAS No	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting de minimis
1,10-Phenanthroline, Monohydrate	5144-89-8	None	None	None	None	None

**U.S. TSCA**

Component	CAS No	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
1,10-Phenanthroline, Monohydrate	5144-89-8	Not Applicable	Not Applicable

**Canada****WHMIS 2015 - GHS Classifications**

WHMIS 2015 Hazard Classification

The WHMIS 2015 classification of this product has not been validated or reviewed yet.

**Product code:** P1055

**Product name:**  
1,10-PHENANTHROLINE,  
MONOHYDRATE, REAGENT, ACS

**Page** 10 / 12

Information:

**Canada Hazardous Products Regulation** This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

#### DSL/NDSL

Component	CAS No	Canada (DSL)	Canada (NDSL)
1,10-Phenanthroline, Monohydrate	5144-89-8	Not Listed	Not Listed

Component	CAS No	CEPA Schedule I - Toxic Substances
1,10-Phenanthroline, Monohydrate	5144-89-8	Not listed

Component	CAS No	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
1,10-Phenanthroline, Monohydrate	5144-89-8	Not listed

#### EU Classification

##### EU GHS - SV - CLP 1272/2008

Component	CAS No	EU GHS - SV - CLP (1272/2008)
1,10-Phenanthroline, Monohydrate	5144-89-8	

##### EU - CLP (1272/2008)

#### R-phrase(s)

R25 - Toxic if swallowed

#### S -phrase(s)

S46 - If swallowed, seek medical advice immediately and show this container or label

Component	CAS No	Classification	Concentration Limits:	Safety Phrases
1,10-Phenanthroline, Monohydrate	5144-89-8		No information	

The product is classified in accordance with Annex VI to Directive 67/548/EEC

#### Indication of danger:

T - Toxic

T



#### 16. OTHER INFORMATION

Preparation Date: 08/14/2015  
Revision date: 04/18/2019  
Prepared by: Sonia Owen

Product code: P1055

Product name:  
1,10-PHENANTHROLINE,  
MONOHYDRATE, REAGENT, ACS

Page 11 / 12

**Disclaimer:**

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

**End of Safety Data Sheet**