



From: Mallinckrodt Baker, Inc.  
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24 Hour Emergency Telephone: 908-859-2151  
CHEMTREC: 1-800-424-9300  
National Response in Canada  
CANUTEC: 813-996-6666  
Outside U.S. And Canada  
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

## 1, 10-PHENANTHROLINE MONOHYDRATE

### 1. Product Identification

**Synonyms:** Orthophenanthroline monohydrate; 4,5-Diazaphenanthrene monohydrate  
**CAS No.:** 66-71-7 (Anhydrous) 5144-89-8 (Monohydrate)  
**Molecular Weight:** 198.22  
**Chemical Formula:** C<sub>12</sub>H<sub>8</sub>N<sub>2</sub>.H<sub>2</sub>O  
**Product Codes:** T170

### 2. Composition/Information on Ingredients

| Ingredient           | CAS No  | Percent   | Hazardous |
|----------------------|---------|-----------|-----------|
| 1, 10-Phenanthroline | 66-71-7 | 90 - 100% | Yes       |

### 3. Hazards Identification

#### Emergency Overview

**WARNING! MAY BE HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.**

**SAF-T-DATA<sup>(tm)</sup>** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate  
Flammability Rating: 1 - Slight  
Reactivity Rating: 1 - Slight  
Contact Rating: 2 - Moderate (Life)  
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES  
Storage Color Code: Green (General Storage)

#### Potential Health Effects

##### Inhalation:

No information found, but compound should be handled as a potential health hazard. May cause irritation to the respiratory tract. Symptoms may include coughing, sore throat, labored breathing, and chest pain.

##### Ingestion:

No information found, but compound should be handled as a potential health hazard. May cause irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.

##### Skin Contact:

No information found, but compound should be handled as a potential health hazard. May cause irritation with redness and pain. May be absorbed through the skin with possible systemic effects.

##### Eye Contact:

No information found, but compound should be handled as a potential health hazard. May cause irritation, redness and pain.

##### Chronic Exposure:

No information found, but compound should be handled as a potential chronic health hazard.

##### Aggravation of Pre-existing Conditions:

No information found.

## 4. First Aid Measures

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:**

Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.

**Skin Contact:**

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if symptoms occur.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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## 5. Fire Fighting Measures

**Fire:**

As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.

**Explosion:**

Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

**Fire Extinguishing Media:**

Water spray, dry chemical, alcohol foam, or carbon dioxide.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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## 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

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## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Isolate from oxidizing materials. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

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## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**

None established.

**Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):**

For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

**Skin Protection:**

Wear protective gloves and clean body-covering clothing.

**Eye Protection:**

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

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## 9. Physical and Chemical Properties

**Appearance:**

White powder.

**Odor:**

Slight odor

**Solubility:**

Soluble in 300 parts water.

**Density:**

No information found.

**pH:**

No information found.

**% Volatiles by volume @ 21C (70F):**

0

**Boiling Point:**

No information found.

**Melting Point:**

93 - 94C (199 - 201F) Becomes anhydrous @ 117C (242F)

**Vapor Density (Air=1):**

No information found.

**Vapor Pressure (mm Hg):**

No information found.

**Evaporation Rate (BuAc=1):**

No information found.

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## 10. Stability and Reactivity

**Stability:**

Stable under ordinary conditions of use and storage.

**Hazardous Decomposition Products:**

Burning may produce carbon monoxide, carbon dioxide, nitrogen oxides.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Strong oxidizers.

**Conditions to Avoid:**

No information found.

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## 11. Toxicological Information

**Toxicological Data:**

Anhydrous: Investigated as a mutagen, reproductive effector. Hydrate: Investigated as a mutagen.

**Reproductive Toxicity:**

It was teratogenic in a single study in mice. Its reproductive hazard in humans is unknown.

-----\Cancer Lists\-----

| Ingredient                    | ---NTP Carcinogen--- |             | IARC Category |
|-------------------------------|----------------------|-------------|---------------|
|                               | Known                | Anticipated |               |
| 1,10-Phenanthroline (66-71-7) | No                   | No          | None          |

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## 12. Ecological Information

**Environmental Fate:**

No information found.

**Environmental Toxicity:**

No information found.

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## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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## 14. Transport Information

Not regulated.

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## 15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----

| Ingredient                    | TSCA | EC  | Japan | Australia |
|-------------------------------|------|-----|-------|-----------|
| 1,10-Phenanthroline (66-71-7) | Yes  | Yes | Yes   | Yes       |

-----\Chemical Inventory Status - Part 2\-----

| Ingredient                    | --Canada-- |     |      |       |
|-------------------------------|------------|-----|------|-------|
|                               | Korea      | DSL | NDSL | Phil. |
| 1,10-Phenanthroline (66-71-7) | Yes        | Yes | No   | No    |

-----\Federal, State & International Regulations - Part 1\-----

| Ingredient                    | -SARA 302- |     | -SARA 313- |                |
|-------------------------------|------------|-----|------------|----------------|
|                               | RQ         | TPQ | List       | Chemical Catg. |
| 1,10-Phenanthroline (66-71-7) | No         | No  | No         | No             |

-----\Federal, State & International Regulations - Part 2\-----

| Ingredient                    | CERCLA | -RCRA- |                |
|-------------------------------|--------|--------|----------------|
|                               |        | 261.33 | -TSCA-<br>8(d) |
| 1,10-Phenanthroline (66-71-7) | No     | No     | No             |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No  
 SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No  
 Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.

**Poison Schedule:** None allocated.

**WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: 2 Flammability: 1 Reactivity: 0

**Label Hazard Warning:**

WARNING! MAY BE HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

**Label Precautions:**

Avoid contact with eyes, skin and clothing.

Avoid breathing dust.

Use with adequate ventilation.

Wash thoroughly after handling.

Keep container closed.

**Label First Aid:**

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. In all cases, get medical attention.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No Changes.

**Disclaimer:**

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