



---

# Benzonitrile

---

## 1. Product Identification

**Synonyms:** Phenyl Cyanide; Cyanobenzene

**CAS No.:** 100-47-0

**Molecular Weight:** 103.12

**Chemical Formula:** C<sub>6</sub>H<sub>5</sub>CN

**Product Codes:** B883

---

## 2. Composition/Information on Ingredients

Ingredient	CAS No	Percent
Hazardous		
-----	-----	-----
-----		
Benzonitrile	100-47-0	90 - 100%
Yes		

---

## 3. Hazards Identification

## Emergency Overview

---

**WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM. COMBUSTIBLE LIQUID AND VAPOR. POISONOUS GASES ARE PRODUCED IN FIRE.**

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

---

Health Rating: 2 - Moderate

Flammability Rating: 2 - Moderate

Reactivity Rating: 1 - Slight

Contact Rating: 3 - Severe (Life)

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES;  
CLASS B EXTINGUISHER

Storage Color Code: Red (Flammable)

---

## Potential Health Effects

---

Although this material is not as dangerous as certain cyanide compounds like hydrogen cyanide and sodium cyanide, it can cause cyanide poisoning. People who work with or around this material should be trained in first aid measures for cyanide overexposures. Symptoms of cyanide poisoning include salivation, nausea without vomiting, anxiety, confusion, giddiness, vertigo, lower jaw stiffness, convulsions, paralysis, spasm of the back muscles causing the head and lower limbs to bend backward and the trunk to arch forward, coma, irregular heartbeat, respiratory stimulation followed by respiratory failure, and death. In most cases, cyanide poisoning causes a deceptively healthy pink to red skin color. However, if a physical injury or lack of oxygen is involved, the skin color may be bluish. Reddening of the eyes and pupil dilation are symptoms of cyanide poisoning. Cyanosis (blue discoloration of the skin) tends to be associated with severe cyanide poisonings.

### **Inhalation:**

Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. Other symptoms may include weakness, headaches, confusion, flushing, occasional nausea and vomiting, increased respiratory rate and pulse followed by decreased respiratory rate and pulse.

### **Ingestion:**

Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea. Other symptoms may parallel those from inhalation.

### **Skin Contact:**

Causes irritation to skin. Symptoms include redness, itching, and pain. May be absorbed through the skin with possible systemic effects.

**Eye Contact:**

Causes irritation, redness, and pain.

**Chronic Exposure:**

No information found.

**Aggravation of Pre-existing Conditions:**

No information found.

---

## 4. First Aid Measures

The following first aid procedures apply when cyanide poisoning is suspected. If cyanide poisoning is not suspected, lesser first aid measures will be appropriate.

FOR ANY ROUTE OF EXPOSURE ADMINISTER AMYL NITRITE, SODIUM NITRITE AND SODIUM THIOSULFATE PER PRE-PLANNED INSTRUCTIONS. IN CASE OF CYANIDE POISONING, start first aid treatment immediately, then get medical attention. A cyanide antidote kit (amyl nitrite, sodium nitrite and sodium thiosulfate) should be available in any cyanide work area. Actions to be taken in case of cyanide poisoning should be planned and practiced before beginning work with cyanides. Oxygen and amyl nitrite can be given by a first responder before medical help arrives. Allow victim to inhale amyl nitrite for 15-30 seconds per minute until sodium nitrite and sodium thiosulfate can be administered intravenously (see Note to Physician). A new amyl nitrite ampule should be used every 3 minutes. If conscious but symptoms (nausea, difficult breathing, dizziness, etc.) are evident, give oxygen. If consciousness is impaired (non-responsiveness, slurred speech, confusion, drowsiness) or the patient is unconscious but breathing, give oxygen and amyl nitrite by means of a respirator. If not breathing, give oxygen and amyl nitrite immediately by means of a positive pressure respirator (artificial respiration).

**Inhalation:**

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. DO NOT GIVE MOUTH-TO-MOUTH RESUSCITATION. If breathing is difficult, give oxygen. Keep patient warm and at rest.

**Ingestion:**

If ingested and the patient is conscious, immediately give the patient activated charcoal slurry. Never give anything by mouth to an unconscious person. Do not induce vomiting as it could interfere with resuscitator use.

**Skin Contact:**

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.

**Eye Contact:**

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

**Note to Physician:**

If patient does not respond to amyl nitrite, inject intravenously with 10mL of a 3% solution of sodium nitrite at a rate of not more than 2.5 to 5 mL per minute. Once nitrite

administration is complete, follow directly with 50 mL of a 25% solution of sodium thiosulfate at the same rate by the same route. Give victim oxygen and keep under observation. If exposure was severe, watch victim for 24-48 hours. If signs of cyanide poisoning persist or reappear, repeat nitrite and thiosulfate injections 1 hour later in 1/2 the original doses. Cyanocobalamin (B12), 1 mg intramuscularly, may speed recovery. Moderate cyanide exposures need be treated only by supportive measures such as bed rest and oxygen.

---

## 5. Fire Fighting Measures

### **Fire:**

Flash point: 72C (162F) CC

Combustible Liquid and Vapor!

### **Explosion:**

Above flash point, vapor-air mixtures are explosive within flammable limits noted above.

### **Fire Extinguishing Media:**

Dry chemical, foam or carbon dioxide. Water may be ineffective. Water spray may be used to keep fire exposed containers cool.

### **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. May emit toxic and flammable fumes of cyanide if involved in a fire.

---

## 6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

---

## 7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area away from sources of heat or ignition. Protect against physical damage. Store separately from reactive or

combustible materials, and out of direct sunlight. All persons with the potential for cyanide poisoning should be trained to provide immediate First Aid using oxygen and amyl nitrite. A cyanide antidote kit (amyl nitrite, sodium nitrite, and sodium thiosulfate) should be readily available in cyanide workplaces. The antidotes should be checked annually to ensure they are still within their shelf-lives. Identification of community hospital resources and emergency medical squads in order to equip and train them on handling cyanide emergencies is essential. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

### **Airborne Exposure Limits:**

-OSHA Permissible Exposure Limit (PEL):  
for hydrogen cyanide = 10 ppm (TWA), skin.

-ACGIH Threshold Limit Value (TLV):  
for hydrogen cyanide = 4.7 ppm, ceiling, skin.

### **Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. 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):**

If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airtight hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134).

### **Skin Protection:**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

### **Eye Protection:**

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

## 9. Physical and Chemical Properties

### **Appearance:**

Clear oily liquid.

### **Odor:**

Almond odor.

**Solubility:**

Slight (0.1-1%)

**Specific Gravity:**

1.01 @ 15C/15C

**pH:**

No information found.

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

0

**Boiling Point:**

190C (374F)

**Melting Point:**

-13C (9F)

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

3.6

**Vapor Pressure (mm Hg):**

1 @ 25C (77F)

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

0.1

## 10. Stability and Reactivity

**Stability:**

Stable under ordinary conditions of use and storage.

**Hazardous Decomposition Products:**

May emit toxic and flammable fumes of cyanide if involved in a fire.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Strong oxidizers.

**Conditions to Avoid:**

Heat, flames, ignition sources and incompatibles.

## 11. Toxicological Information

Oral mouse LD50: 971 mg/kg; inhalation mouse LC50: 1800 mg/m<sup>3</sup>; skin rabbit LD50: 1250 mg/kg. Investigated as a mutagen.

Ingredient Category	---NTP Carcinogen---		IARC
	Known	Anticipated	
-----\Cancer Lists\-----			

Benzonitrile (100-47-0)  
None

No

No

---

## 12. Ecological Information

### Environmental Fate:

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material may evaporate to a moderate extent. When released into water, this material is expected to readily biodegrade. When released into water, this material may evaporate to a moderate extent. When released into the water, this material is expected to have a half-life between 1 and 10 days. This material has an estimated bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of greater than 30 days.

### Environmental Toxicity:

This material is expected to be slightly toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

---

## 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.

---

## 14. Transport Information

### Domestic (Land, D.O.T.)

-----

**Proper Shipping Name:** BENZONITRILE

**Hazard Class:** 6.1

**UN/NA:** UN2224

**Packing Group:** II

**Information reported for product/size:** 500ML

### International (Water, I.M.O.)

-----

**Proper Shipping Name:** BENZONITRILE

**Hazard Class:** 6.1

UN/NA: UN2224  
 Packing Group: II  
**Information reported for product/size: 500ML**

**International (Air, I.C.A.O.)**

**Proper Shipping Name:** BENZONITRILE  
**Hazard Class:** 6.1  
 UN/NA: UN2224  
 Packing Group: II  
**Information reported for product/size: 500ML**

## 15. Regulatory Information

```

-----\Chemical Inventory Status - Part 1\-----
-----
Ingredient                                TSCA  EC   Japan
Australia
-----
Benzonitrile (100-47-0)                   Yes   Yes  Yes
Yes
  
```

```

-----\Chemical Inventory Status - Part 2\-----
-----
Ingredient                                Korea  DSL  --Canada--
Phil.                                     NDSL
-----
Benzonitrile (100-47-0)                   Yes   Yes  No
Yes
  
```

```

-----\Federal, State & International Regulations - Part 1\-----
-----
313----- -SARA 302-  -----SARA
Ingredient                                RQ    TPQ   List
Chemical Catg.
-----
Benzonitrile (100-47-0)                   No    No    No
No
  
```

```

-----\Federal, State & International Regulations - Part 2\-----
-----
TSCA-                                         -RCRA-  -
Ingredient                                CERCLA  261.33  8(d)
-----
Benzonitrile (100-47-0)                   5000    No      No
  
```



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

**Australian Hazchem Code:** 3X

**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: 3 Flammability: 2 Reactivity: 0

**Label Hazard Warning:**

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM. COMBUSTIBLE LIQUID AND VAPOR. POISONOUS GASES ARE PRODUCED IN FIRE.

**Label Precautions:**

Avoid contact with eyes, skin and clothing.

Wash thoroughly after handling.

Avoid breathing dust.

Keep container closed.

Use only with adequate ventilation.

Keep away from heat and flame.

**Label First Aid:**

IF CYANIDE POISONING IS SUSPECTED, GET MEDICAL ATTENTION IMMEDIATELY. KEEP A CYANIDE ANTIDOTE KIT in area of product use or storage. First-aiders must take precautions to avoid contact with cyanide substance. Administer amyl nitrite and oxygen per pre-planned directions. IF INHALED, remove to fresh air. If not breathing, give artificial respiration. DO NOT GIVE MOUTH-TO-MOUTH RESUSCITATION. If breathing is difficult, give oxygen. Keep patient warm and at rest. If ingested and the patient is conscious, immediately give the patient activated charcoal slurry. Never give anything by mouth to an unconscious person. Do not induce vomiting as it could interfere with resuscitator use. 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.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No Changes.

<http://www.sparchem.com>