

**Standard Operating Procedure for Using Cyanides**

Print a copy and keep with your Safety Data Sheets and training documents.

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| Department |  |
| Principal Investigator (PI) |  |
| PI Phone Number |  |
| Lab Manager |  |
| Lab Manager Phone Number |  |
| Emergency Contact |  |
| Emergency Contact Phone Number |  |

1. **Purpose**

The purpose of this document is to provide the information necessary to safely use cyanide in the \_\_\_\_\_\_\_\_\_\_\_ laboratory and to comply with requirements of the OSHA standard 29 CFR 1910 Subpart Z ([CAS 57-12-5](https://www.osha.gov/chemicaldata/chemResult.html?recNo=787)).

1. **Hazard Identification:**

* ***Extremely Toxic!!*** *-- Hydrogen cyanide and its salts are extremely toxic. Exposure to as little as 50-150 mg can cause immediate collapse and death.*
* *Inhalation Hazard* **–** Cyanide salts, such as sodium and potassium cyanide, are solids. However, they convert quickly to gaseous HCN when exposed to acid or moisture. Therefore, as in the case of HCN, great care must be taken to absolutely avoid inhalation of any vapors, as well as any aerosolized dust.
  + Initial symptoms of cyanide exposure include weakness, headache, dizziness, rapid breathing, nausea and vomiting. If these symptoms are observed while in an area where cyanide is being handled, get medical attention immediately by dialing 911 from a campus phone.
* *Fire Hazard* -- Hydrogen cyanide is an extremely flammable gas, and must be stored and handled away from ignition sources. Cyanide salts are generally noncombustible solids. However, reaction with acid and moisture releases flammable hydrogen cyanide.

1. **Engineering & Administrative Controls**

Cyanide must only be handled/used within the chemical fume hood, which is designed to pull air and fumes up and away from the user (Engineering Control).

All lab personnel who use cyanide must be trained on the hazards of cyanide, including being familiar with this SOP (Administrative Control).

The door to the \_\_\_\_\_\_\_\_\_\_\_ lab is posted with signage indicating the presence and hazards associated with cyanide (Administrative Control).

1. **Personal Protective Equipment (PPE)**

* *Hand Protection*: Neoprene gloves are acceptable for incidental exposure. Butyl rubber or Viton gloves are preferable if the loss of manual dexterity they cause is acceptable.
* *Eye Protection*: Safety glasses or splash goggles must be worn when handling cyanide.
* *Skin and Body Protection*: A lab coat must be worn when handling cyanide.
* *Respiratory Protection*: Cyanide must only be used in the chemical fume hood. Do not open, pour, etc. cyanide anywhere other than the chemical fume hood.

1. **Standard Operating Procedures for Handling Cyanide:** 
   1. Great care must be taken to avoid all exposure to hydrogen cyanide and cyanide salts, most notably inhalation and skin contact. The proper use of engineering/ventilation controls and skin and eye protection is imperative to avoid a high risk of fatality.
   2. Maintain awareness of the pH of any cyanide salt solutions, as an acidic pH will release the very toxic and flammable hydrogen cyanide gas.
   3. Hydrogen cyanide containers should be protected from physical damage and stored in a ventilated area away from ignition sources and other materials. It should not be stored for extended periods (>90 days) due to explosion risk as a result of decomposition.
      1. Cyanide salts should be stored in a cool, dry location, separated from acids.
   4. As they deem necessary, the PI/supervisor should insert here any information about whether a special use-area is designated for this material/process.
   5. Add appropriate lab-specific information here describing how this material(s) is generally used. E.g., name of protocol, typical frequency done, quantities used, temperature and any additional safety measures, etc.
2. **Chemical Disposal**

Keep a separate and dedicated waste container for cyanide waste. Maintain awareness of the pH of the accumulated waste, as an acidic pH will release the very toxic and flammable hydrogen cyanide gas.

All chemical waste must be disposed of in accordance with Federal and State regulations and UNM's Chemical Hygiene Plan. Cyanide and cyanide-containing wastes should be placed in a suitable container and properly labeled as soon as waste is added to the container. Cyanide waste should be labeled as such:

**HAZARDOUS WASTE**

**Cyanide waste**

**Toxic, Reactive**

Call EHS at 277-2753 to schedule a pickup of waste cyanide and/or other waste chemicals.

1. **Spill Procedures:**

For small/minor spills (<1L), use the materials in the spill kit to clean up the spill. Minimum PPE for cleaning up a cyanide spill is safety glasses/goggles, gloves and lab coat. The spill clean-up materials must be double-bagged, tightly closed, labeled and picked up by EH&S for disposal.

Spills in excess of 1L of cyanide should not be cleaned up by lab personnel. In the event of a large/major spill of cyanide, evacuate the area and call:

* Campus Police -- 911 on a landline or 505-277-2241 on a mobile phone, and
* Environmental Health & Safety (EH&S) – 505-277-2753 during business hours, or
* EH&S Duty Officer Pager -- 505-951-0194 (enter your phone number after the message)

1. **First Aid Procedures**

In the event of a benzene exposure, seek immediate medical attention.

* Skin Contact and Eye Contact should be washed immediately in safety shower or eyewash respectively for 15 minutes.
* If the exposure is severe, seek medical attention at the emergency room. If heading to UNMH, a non-injured person should contact the UNMH charge nurse in advance at 505-604-9349 with information on the chemical and nature of exposure.
* UNM employees should contact Employee Occupational Health Services (EOHS) at 505-272-8034.
* UNM students should contact Student Health Services at 505-277-7810.
* If the exposure occurs after hours, employees and students should seek medical treatment at a hospital emergency room.
* The supervisor of the injured person and EH&S must be notified as soon as possible after the exposure.
* The notice of Accident, Incident, or Spill form should be filled out on the EH&S website.

1. **Other Emergencies**

**Fire or Medical Emergency -- Dial 911**

**Life-Threatening Emergency, After Hours, Weekends and Holidays** – **Dial 911**

**Non-Life Threatening Emergency** – Call EH&S at 505-277-2753 to seek assistance and report the incident.

1. **Training Requirements**

All lab personnel who use cyanide must take the following trainings:

* Cyanide SOP

**Principal Investigator SOP Approval**

By signing and dating here, the Principal Investigator certifies that this Standard Operating Procedure (SOP) for Using Cyanide is accurate and provides information sufficient to safely use cyanide in the (name of lab) laboratory.

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Signature Printed Name/Title Date

I have read and understand the content of this SOP:

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| **Name** | **Signature** | **Date** |
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