

**Standard Operating Procedure for Using Phosgene**

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 phosgene in the \_\_\_\_\_\_\_\_\_\_\_ laboratory and to comply with OSHA standard 29 CFR 1910 Subpart Z ([CAS# 75-44-5](https://www.osha.gov/chemicaldata/chemResult.html?recNo=583))

1. **Hazard Identification:**

*Highly Toxic* --

Phosgene is a highly toxic, irritating and corrosive gas to all body tissues. Inhalation can cause fatal respiratory damage.

* Exposure by inhalation to 20-30 ppm for as little as 1 minute may cause severe irritation of the upper and lower respiratory tract, with symptoms including burning throat, nausea, vomiting, chest pain, coughing, shortness of breath, and headache.
* **Brief exposure by inhalation to 50 ppm can be fatal within a few hours.**

The vapor is irritating to the eyes and skin at 4 ppm. As a condensed liquid it can cause severe skin burns and serious eye damage.

1. **Engineering & Administrative Controls**

Phosgene 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).

Note: Alternatives to phosgene should be considered. Common alternatives include diphosgene and triphosgene carbonate. These two reagents have similar hazard and toxicity profiles as phosgene, but also have a reduced exposure risk due to their being a liquid and a solid, respectively (Substitution Control)

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

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

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

* *Hand Protection*: At a minimum complete protection of the skin is essential. Viton gloves are recommended.
* *Eye Protection*: Safety glasses or splash goggles must be worn when handling phosgene.
* *Skin and Body Protection*: A lab coat must be worn when handling phosgene.
* *Respiratory Protection*: Phosgene should always be used in fume hood, glove box, or in totally-sealed containers.

1. **Handling and Storage:**

Handling

* 1. DO not breathe vapor. Do not get in eyes, on skin or on clothing. Avoid all exposure. Confirm that fume hood and other engineering controls are operating properly before beginning any work with phosgene.
  2. Confirm that gloves, safety goggles and other personal protective equipment are in good condition and not compromised in any way.
  3. As they deem necessary, the PI/supervisor should insert here any information about whether a special use-area is designated for this material/process.
  4. 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.

Storage

1. Keep quantities to a minimum.
2. Keep containers tightly closed and in a toxic gas cabinet or other well-ventilated area.
3. Phosgene reacts vigorously with water/moisture, amines, ammonia and alcohols. Keep segregated.
4. **Chemical Disposal**

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

**HAZARDOUS WASTE**

**Phosgene Waste**

**Highly Toxic & Reactive**

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

1. **Spill Procedures:**

For small/minor spills (<1L) of the liquid or solid alternatives to phosgene gas, use the materials in the spill kit to clean up the spill. Minimum PPE for cleaning up a disphosgene or triphosgene carbonate 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 should not be cleaned up by lab personnel. In the event of a large/major spill of phosgene, 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 Phosgene exposure, seek immediate medical attention.

* If inhaled, seek immediate medical attention at a hospital.
* 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.

**Training Requirements**

All lab personnel who use phosgene must review the lab specific Phosgene SOP before beginning work.

**Principal Investigator SOP Approval**

By signing and dating here, the Principal Investigator certifies that this Standard Operating Procedure (SOP) for Using Phosgene is accurate and provides information sufficient to safely use phosgene in the \_\_\_\_\_\_\_\_\_ 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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