Department:

Date SOP was written:

Principal Investigator:

Building:

Laboratory:

Primary Emergency Contact (Name and Number):

Secondary Emergency Contact (Name and Number):

Enter Chemical Name Here

Synonyms: Enter any synonyms the chemical might have

Clemson University

Standard Operating Procedure

1. **Working Principle:**

Enter what general purpose this chemical will be having in this laboratory. Examples include DNA purification procedures, preservation of biological material, and as a solvent in organic synthesis.

1. **Physical and Chemical Properties** **For experimental materials list all components and percentages.**

**CAS #:**

**Molecular Formula:**

**Physical State (Form):**

**Potential Hazards:**

**Incompatibilities:** Enter the specific types of chemicals that should NOT be stored with this chemical.

1. **Health Effects For experimental materials list all hazards of components**

**Globally Harmonized System (GHS) Pictograms:**

Enter the applicable GHS Pictograms Here

**Signal word:** Enter the applicable signal word here.

**Inhalation:** Enter the harmful health effects that inhaling the chemical would have.

**Oral exposure:** Enter the harmful health effects that ingesting the chemical would have.

**Skin exposure:** Enter the harmful health effects that exposing the chemical to skin would have.

**Eye exposure:** Enter the harmful health effects that eye exposure with the chemical would have.

1. **Regulatory Review: For experimental materials list all components and established exposure limits**

OSHA Permissible Exposure Limit (PEL)

* Enter the OSHA exposure requirements for this chemical.

ACGIH Threshold Limit Value (TLV)

* Enter the ACGIH exposure requirements for this chemical.

NIOSH Recommended Exposure Limits (REL)

* Enter the NIOSH exposure requirements for this chemical.

1. **Controlling Exposure:**

***All procedures involving*** Hazardous Chemical Name ***must be performed in a properly functioning chemical fume hood.*** The fume hood is labeled-

Designated Area

Danger

Chemical Name

Chemical Hazards

AUTHORIZED PERSONNEL ONLY

**Storage: Store away from incompatible materials. Label the container “**Chemical Name**,** Chemical Hazards**.” Keep containers tightly closed in a dry, cool, well-ventilated area.**

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

**Respiratory Protection:**

Respiratory protection should not be necessary for lab personnel if the appropriate safe work practices and use proper ventilation are followed. Lab personnel intending to use/wear a respirator MUST be medically cleared, then trained and fit-tested by Occupational and Environmental Safety (OES) prior to use of any form of respiratory protection (including dust masks). Refer to OES’s [PPE](http://www.clemson.edu/research/safety/ppe/index.html) (webpage) for more information.

**Hand Protection:**

Chemical resistant Latex gloves will be used to work with this chemical in any form

Always check with your glove manufacturer to make sure that the gloves are compatible with the hazardous material in the laboratory. Check these websites by glove manufacturers to ensure that the glove material will offer adequate protection.

Chemical Resistant Glove Directory - [ChemRest](http://www.chemrest.com/)

Ansell - [Ansell Guardian Chemical](https://www.ansellguardianchemical.com/home)

**Eye Protection:**

ANSI approved safety glasses or chemical splash goggles.

**Skin and Body Protection:**

Lab coats should be worn and buttoned. Sleeves should be sufficient to prevent skin exposure while wearing gloves. Lab personnel should also wear full-length pants (or equivalent) and close-toed shoes.

1. **Spill Control:**

***Lab personnel are not required to clean chemical spills themselves. The CUFD HAZMAT team is the primary agency responsible for cleaning spills of hazardous chemicals. However, if lab members are properly equipped, trained, and it is safe to do so, small incidental chemical spill may be handled by laboratory personnel.***

**Small chemical spills** are characterized as small volumes of chemicals (~2 liters or less) that are not highly or acutely toxic, requiring immediate evacuation. All other chemical spills are considered **Large chemical spills** and should not be handled by laboratory personnel. Details on spill control can be found in the OES [Lab Safety Manual (pdf)](https://media.clemson.edu/research/oes/labsafety/Lab_Safety_Manual.pdf) or if any assistance is needed contact the OES small spill clean-up team.

**Small Chemical Spills**

In the event of a small spill of hazardous material, trained lab personnel should do the following:

1. Alert people in immediate area of spill.
2. Wear protective equipment as needed, including safety goggles or face shield, gloves and lab coat. Consult the SDS for proper personal protective equipment requirements.
3. If the chemical is flammable, remove/isolate/disable any source of ignition (i.e. open flames, hotplates, heating mantles, etc. Remember static is a potential ignition source).

***Liquid spill:***

1. Contain the spill around the periphery using spill socks or pads.
2. Use tongs or forceps to pick up any broken glass.
3. Working from the outside in, use absorbent pads to absorb the liquid and place the pads in a hazardous waste bag.
4. Clean spill area with soap and water.
5. Collect residue and related clean up debris in container, properly mark container to identify contents, attach OES Hazardous waste container label and submit on-line [Chemical Waste Pickup Form](https://www.clemson.edu/finops/oes/hazmaterials/wastepickupreq.html).

***Solid spill:***

1. Contains the spill around the periphery.
2. Use a dustpan and brush to carefully collect the solid and place it in the hazardous waste bag.
3. Clean spill area with soap and water.
4. Collect residue and related clean up debris in container, properly mark container to identify contents, attach OES Hazardous waste container label and submit on-line [Chemical Waste Pickup Form](https://www.clemson.edu/finops/oes/hazmaterials/wastepickupreq.html).

**Large Chemical Spills**

In the event of a large spill of hazardous material, should be referred to CUFD HAZMAT for evaluation and remediation:

1. NOTIFY other lab members that a spill has occurred and what the nature of the spill is.
2. EVACUATE the immediate area.
3. ISOLATE the area and prevent access.
4. If you feel, based on the chemical and the scale of the spill, that building evacuation is needed:
   * Immediately call CUFD, 911. Personnel should be prepared to provide the following information:
     + Your full name and phone number
     + Identity of material – Name and properties
     + Location of spill: building, room, location in room
     + Time of spill
     + Actions taken
     + Any injuries or exposures
     + Did material enter sink or drain
5. Attend to injured or contaminated persons and remove them from exposure. In case of personal contamination, remove affected clothing and flush contaminated skin with water for at least 15 minutes.
6. Be prepared to provide information for emergency personnel when they arrive.
7. Do not reenter the building or lab until it is deemed safe by CUFD.
8. **Waste Disposal:**

Label containers of Chemical Name waste with the words “Hazardous Waste, Chemical Name. Chemical Hazard.” Always keep lids on the waste container unless they are in use. When the waste is ready for disposal complete a [Chemical Waste Pickup Form](https://www.clemson.edu/finops/oes/hazmaterials/wastepickupreq.html) on the Clemson OES website. For questions regarding hazardous waste disposal contact the Hazardous Materials Manager, 633-6357.

1. **Emergency Procedures:**

**Inhalation:**

If inhaled, remove to fresh air. If breathing becomes difficult, seek medical attention. Contact CUFD at 911 or 656-2222.

**Skin/Clothing Contact:**

Remove contaminated clothing and rinse body thoroughly in emergency shower for at least 15 minutes. Then seek medical attention. CUFD at 911 or 656-2222.

**Eye Contact:**

Rinse eyeball and inner surface of eyelid in the emergency eyewash station for at least 15 minutes. Then seek medical attention. CUFD at 911 or 656-2222.

**Ingested:**

If swallowed, wash out mouth with water. Then seek medical attention immediately. Contact CUFD at 911 or 656-2222.

1. **Lab-Specific Procedures:**

Enter the specific instructions the laboratory personnel will have to use when working with the hazardous chemical. This may include solvent preparation and usage, etc.

1. **Documentation of Training** (signature of all users is required)

* Prior to conducting any work with Chemical Name, designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must ensure that his/her laboratory personnel have completed all required safety training.

I have read and understand the content of this SOP:

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