**REQUIRED: Insert Name**

**STANDARD OPERATING PROCEDURE (SOP)**

**Type of SOP:** ☐ Process ☐ Hazardous Chemical ☐ Hazardous Class

**All personnel subject to these SOP requirements must review a completed SOP and sign the associated training record. Completed SOPs must be kept in the laboratory’s safety binder or be otherwise readily accessible to laboratory personnel. Electronic access is acceptable. SOPs must be reviewed, and revised where needed, as described in the** [**SJSU Chemical Hygiene Plan**](https://www.sjsu.edu/fdo/departments/ehs/lab/Chemical_Hygiene_Plan.pdf)**. Note that not all hazardous chemicals are appropriately addressed in a single Hazard Class SOP, and some chemicals are subject to several Hazard Class SOPs.**

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| Date SOP Written: | |  | |  | Approval Date: | | |  |
| SOP Prepared by: | | **REQUIRED - Insert Preparer's Name** | | | | | | |
| SOP Reviewed and Approved by (name/signature): | | | | **REQUIRED - Insert Approver's Name & Signature** | | | | |
| Department: | | **REQUIRED - Insert Department** | | | |
| Principal Investigator/ Laboratory Supervisor: | | **REQUIRED - Insert Name** | | | | Phone: | **REQUIRED - Insert Phone#** | | |
| Emergency Contact(s): | | **REQUIRED - Insert Name** | | | | Phone: | **REQUIRED - Insert Phone#** | | |
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| Location(s) covered by SOP: | Building: | | **REQUIRED - Insert Name** | | | Lab Phone: | **REQUIRED - Insert Phone#** | | |
| Room #(s): | | **REQUIRED - Insert Number** | | |

1. **HAZARD OVERVIEW**

**REQUIRED:** Give a brief description of the process involving the hazardous chemicals covered by this SOP. Examples include naming or describing a chemical reaction or type of reactions, a hazardous process (e.g. distillation, working with high or low pressure systems, etc.), or a class of chemicals (e.g. flammable liquids). *Essentially, ‘I’m working with this material for this reason.’*

1. **HAZARDOUS CHEMICAL(S)/CLASS OF HAZARDOUS CHEMICAL(S)**

Describe the hazard(s) in this section. For example, if you are writing this SOP about a reaction, list all chemicals to be used (including solvents) and a summary of their hazardous properties (using pictograms or [GHS H-codes and hazard statements](https://www.sigmaaldrich.com/content/dam/sigma-aldrich/docs/promo_NOT_INDEXED/General_Information/1/h_overview.pdf)). Describe what the hazards might mean, practically. For example, a particular chemical is highly flammable, meaning it is extremely volatile and has a low flash point, which combined could lead to a flash fire if there are ignition sources present. Another example would be a toxin that is readily absorbed through the skin. Also describe the signs and symptoms of exposure to the chemical (the Safety Data Sheet and [PubChem](https://pubchem.ncbi.nlm.nih.gov/)’s Laboratory Chemical Safety Sheet (LCSS) are excellent sources for this information). *Essentially, ‘I will be using these chemicals. These are the hazards associated with each one and these are the signs and symptoms of exposure to each chemical.’*

**REQUIRED:** List (or attach) the applicable chemical(s) for your inventory, and describe important properties and signs/symptoms of exposure.

1. **ENGINEERING/VENTILATION CONTROLS**

**REQUIRED:** Describe the lab-specific engineering or ventilation controls and equipment safety features (if applicable) that will be used to reduce the risk of chemical exposures to the chemicals described in this SOP.

1. **ADMINISTRATIVE CONTROLS**

The following elements are required:

1. Complete laboratory safety training prior to working in the laboratory;
2. Complete laboratory-specific safety orientation and training on laboratory-specific safety equipment, procedures, and techniques to be used, including the location of laboratory safety equipment (emergency eyewash, safety shower, fire extinguisher);
3. Demonstrate competency to perform the procedures described in this SOP to the Principal Investigator (PI) or trainer;
4. Be familiar with the location and content of any Safety Data Sheets (SDSs) for the chemicals used (online SDSs are available from [MSDS online](https://msdsmanagement.msdsonline.com/8511b604-100d-449a-9a6b-366eff19da04/ebinder/?nas=True));
5. Inspect all equipment and experimental setups prior to use;
6. Follow best practices for the movement, handling, and storage of hazardous chemicals (see Chapters 5 and 6 of [Prudent Practices in the Laboratory](http://ucanr.edu/sites/ucehs/files/133892.pdf) for more detail). An appropriate spill cleanup kit must be located in the laboratory. Chemical and hazardous waste storage must follow an appropriate segregation scheme and include appropriate labeling. Hazardous chemical waste must be properly labelled, stored in closed containers, in secondary containment, and in a designated location;
7. Do not deviate from the instructions described in this SOP without prior discussion and approval from the PI; and
8. Notify the PI of any accidents, incidents, near-misses, or unexpected outcomes involving the Chemical/Hazard Class/Process described in this SOP.

**REQUIRED:** Insert the laboratory-specific restrictions on maximum quantities to be used or stored, including any special handling or storage requirements.

**INSERT IF APPLICABLE:** Describe any additional administrative controls (e.g. restrictions on working alone/procedure/work equipment/work locations/unattended operations). Include any chemical-specific administrative controls (e.g. peroxide formers, potentially explosive compounds).

1. **PERSONAL PROTECTIVE EQUIPMENT (PPE)**

At a minimum, long pants (covered legs) and closed toe/closed heel shoes (covered feet) are required to enter a laboratory or technical area where hazardous chemicals are used or stored.

In addition to the minimum attire required upon entering a laboratory, the following PPE is required for work with the Chemical/Hazard Class/Process described in this SOP:

1. **Eye Protection** (must be ANSI Z87.1-compliant)**:**
2. At a minimum safety glasses are necessary.
3. Splash goggles may be substituted for safety glasses, and are required for processes where splashes are foreseeable or when generating aerosols.
4. Ordinary prescription glasses are not acceptable eye protection and cannot be used in lieu of proper safety eyewear.
5. **Body Protection**: At a minimum a chemically-compatible laboratory coat that fully extends to the wrist is necessary. A chemically-compatible lab coat may be substituted for other types of body protection (e.g. apron, disposable sleeves, etc.) so long as the substituted protection provides similar or better protection to the researcher.
6. If a risk of fire exists, a flame-resistant laboratory coat that is NFPA 2112-compliant should be worn.
7. For chemicals that are corrosive and/or toxic by skin contact/absorption additional protective clothing (e.g. face shield, chemically-resistant apron, disposable sleeves, etc.) are required where splashes or skin contact is foreseeable.
8. **Hand Protection**: Hand protection is needed for the activities described in this SOP. Define the type of glove to be used based on:
9. The chemical(s) being used;
10. The anticipated chemical contact (e.g. incidental, immersion, etc.);
11. The manufacturers’ permeation/compatibility data; and
12. Whether a combination of different gloves is needed for a specific procedural step/task.

**REQUIRED:** Insert lab-specific descriptions of PPE and hygiene practices used with Chemical/Hazard Class/Process described in this SOP, including any specialized PPE needed for a procedural step or specific task.

1. **SPILL AND EMERGENCY PROCEDURES**

Do not attempt to clean up a chemical spill unless you have been trained and feel comfortable doing so. Contact the College Safety Team or Environmental Health & Safety (EH&S), for help with cleaning up a small chemical spill. For a large spill, confine the spill within the fume hood or room, evacuate everyone from the lab, and call 911 (or 408-924-2222 from a non-campus phone).

**REQUIRED:** Insert description of who to call in case of spill in the lab.

1. **WASTE MANAGEMENT AND DECONTAMINATION**

**Waste Management:**

Hazardous waste must be managed as outlined in [SJSU’s Chemical Hygiene Plan](https://www.sjsu.edu/fdo/departments/ehs/lab/Chemical_Hygiene_Plan.pdf), and must be [properly labeled](http://www.science.sjsu.edu/safety/HazWasteForm.pdf). In general, hazardous waste must be removed from your laboratory within nine months of the accumulation start date.

**REQUIRED:** Insert description(s) of laboratory-specific information on the waste streams generated, storage location, and any special handling/storage requirements.

**Decontamination:**

Decontamination procedures vary depending on the material being handled. The toxicity of some materials can be neutralized with other reagents. All surfaces and equipment should be wiped with the appropriate cleaning agent following dispensing or handling to prevent accumulation of chemical residue. Decontaminate vacuum pumps or other contaminated equipment before removing them from the designated area.

Carefully inspect work areas to make sure no hazardous materials remain. Clean contaminated work areas with an appropriate cleaning agent, and dispose of cleaning materials properly. Be sure all ignition sources are secured before beginning clean up with flammable liquids.

**REQUIRED:** Insert description(s) of decontamination procedures for equipment, glassware, and/or controlled areas (e.g. gloveboxes, restricted access hoods, or designated portions of the laboratory).

Upon completion of work with the Chemical/Hazard Class/Process described in this SOP and/or decontamination of equipment, remove gloves and/or PPE to wash hands and arms with soap and water. Additionally, upon leaving a designated work area remove all PPE worn and wash hands and forearms as needed. Contaminated clothing or PPE should not be worn outside the lab. Soiled lab coats should be sent for professional laundering. Grossly contaminated clothing/PPE and disposable gloves must disposed of as hazardous waste.

1. **DESIGNATED AREA**

**REQUIRED:** Insert description(s) of the designated area(s) for the Chemical/Hazard Class/Process described in this SOP to occur in your laboratory. The entire laboratory, a portion of the laboratory, a fume hood, etc. can be designated.

1. **DETAILED PROTOCOL**

**REQUIRED:** Insert or attach the lab-specific protocol for the process, hazardous chemical(s), or hazard class described in this SOP. Include any relevant resources such as journal articles, patents, etc. as desired.

**TEMPLATE REVISION HISTORY**

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| --- | --- | --- | --- |
| **Version** | **Date Implemented** | **Author** | **Revision Notes:** |
| **1.0** | **4/3/2020** | **Alexi Ball-Jones** | **New, blank template** |
| **1.1** | **10/27/2020** | **Alexi Ball-Jones** | **Updated hyperlinks** |
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**LAB-SPECIFIC REVISION HISTORY**

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| --- | --- | --- | --- |
| **Version** | **Date Approved** | **Author** | **Revision Notes:** |
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**Documentation of Standard Operating Procedure Training**

*(Signature of all users is required)*

* Prior to using **INSERT SOP NAME**, laboratory personnel must be trained on the hazards described in this SOP, how to protect themselves from these hazards, and emergency procedures.
* Ready access to this SOP and to a Safety Data Sheet for each hazardous material described in the SOP must be made available.
* The Principal Investigator (PI), or the Laboratory Supervisor if the activity does not involve a PI, must ensure that their laboratory personnel have attended appropriate laboratory safety training or refresher training within the last three years.
* Training must be repeated following **any** revision to the content of this SOP. Training must be documented. This training sheet is provided as one option; other forms of training documentation (including electronic) are acceptable but records must be accessible and immediately available upon request.

**Designated Trainer:** *(signature is required)*

I have read and acknowledge the contents, requirements, and responsibilities outlined in this SOP:

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| **Name** | **Signature** | **Trainer Initials** | **Date** |
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