**Guidelines for Creating a Laboratory-Specific Chemical Standard Operating Procedure**

**(Lab-Specific Chemical SOP)**

This document serves as guidance for completing the Laboratory-Specific Chemical Standard Operating Procedure (Lab-specific Chemical SOP) for a chemical or process. Include relevant information for all sections. Initial sources of chemical-specific information are PubChem, Safety Data Sheets (SDS) from a manufacturer, and the EHS website. This list is not exclusive; other sources might contain more relevant information. Save documentation with other electronic laboratory materials or print and place with other safety information for your laboratories. Please contact the Environmental Health and Safety (EHS) at 713-743-5858 or email ehs@uh.edu with any questions.

If there is a written experimental protocol that incorporates relevant safety information from the below sections, this can be used in lieu of completing the SOP Template.

**Laboratory and SOP descriptive information:**

* Chemical name with CAS# or process
* Principal Investigator
* Principal Investigator Signature-**when SOP is finalized/updated**
* Date-**when SOP is finalized/updated**
* Building
* Room(s)
* Designated work area
1. **Hazard Identification**
	1. **Preparation and Use:** Describe the circumstances of use for the hazardous chemical, including how any stock solutions and/or working solutions are prepared. If this SOP is for a process, describe each hazardous chemical that is used in the process. At minimum, describe the following for each chemical:
* **Ingredients and Concentrations**- Describe the preparatory steps for the needed concentration and/or how the chemical is obtained (e.g., product # 1234, purchased from Sigma-Aldrich) in needed concentration.
* **Quantity-**Amount needed for individual experiments.
* **Frequency-**Detail frequency of use for each chemical.
* **Designated Location-**Indicate use on benchtop, in chemical fume hood, a dedicated location in the laboratory, etc. For example, in the chemical fume hood in SR1 Rm 134.

b. **Potential Hazards and Risk:** Consider “worst-case scenarios” when describing the hazards and risk associated with the chemical; how can the risk be minimized?

* What are the inherent hazards and associated risks with using the chemical?
* Are there physical and/or health hazards as purchased and in-use?
* Describe the purchased and in-use physical state and condition for each chemical.
* Describe the route of a potential exposure (e.g., inhalation, dermal, etc.).
* When/how would an exposure occur (e.g., inhalation of gases/vapors, while weighing and mixing, etc.)?
1. **Hazard Control**
	1. **Engineering Controls:** Engineering controls are equipment or workplace modifications that reduce or prevent hazards from coming into contact with workers.
* Are engineering controls necessary for the chemical(s)?
* Will the chemical(s) be handled in chemical fume hood, glove box, biological safety cabinet, gas cabinet, canopy hood, blast shield, etc.?

Note: Engineering controls are preferred over administrative controls and Personal Protective Equipment (PPE). Some type of containment (chemical fume hood or glove box) is required for use of Particularly Hazardous Substances that are aerosols, powders, concentrated or volatile liquids, or gases.

* 1. **Administrative Controls:** Explain safe work practices and laboratory policies. Consider:
* Describing special handling requirements.
* Describing special equipment requirements.
* Chemical storage and incompatibilities.
* Describing additional safe work practices, such as keeping containers closed, working away from open flames, buddy system, chemical access control, etc.
* How will the work surface and equipment be decontaminated after use? (Required for chemicals that are listed as Particularly Hazardous Substance (PHS) with health hazards)
* Describing how the chemical is transported both inside and outside of the laboratory setting. (e.g. Use of secondary containment; traveling through low-traffic hallways;

avoid using passenger elevator when possible)

Notes: **At minimum, all chemical secondary containers, such as vials, flasks, or bottles, must be labeled with a chemical name (and concentration, if diluted) and the appropriate hazard warnings.** If feasible, weigh powders in a fume hood. If not, add powder to a tared weighing boat (or other container) in the hood and then cover before returning to the balance. Chemicals that may form peroxides or shock-sensitive crystals shall be dated with both the “receipt date” and “opened” date.

* 1. **Personal Protective Equipment:** Describe PPE requirements for each task involving the chemical.
* List the PPE requirement for eye protection, body protection, and hand protection, etc.
* How often will PPE be changed?
* Are there specialized PPE requirements (e.g., respirators, flame resistant lab coat, etc.) for safe use?

Note: Respirator use requires laboratory personnel participation in the Respiratory Protection Program, which involves medical clearance, annual fit testing, and training. Respirators are masks designed to protect the wearer from specific airborne hazards and are different from surgical masks, which only protect the wearer from splashes and are primarily intended to protect others from infectious aerosols exhaled by the wearer. Please be clear about use of surgical masks versus respirators.

1. **Waste Disposal**

Describe how chemical waste is stored and disposed of and lab-specific waste container labelling requirement. If the chemical is considered regulated waste, any unused or unwanted portion (and its container, unless the container is empty) must be disposed of as hazardous waste in accordance with the Regulated Waste Manual. If you have specific questions about disposal, please call EHS 713-743-5858 or email ehs@uh.edu.

1. **Emergencies, Spill Procedures, and Exposures/Unintended Contact**

 Describe how laboratory personnel should handle a chemical-specific emergency or chemical spill.

* On UH main campus, “large” spills of hazardous chemicals, mercury spills, highly acute toxic chemicals, and spills from a chemical waste container must be referred to the spill response team by calling 911 from a campus phone or 713-743-3333 from any phone. Lab personnel may also contact EHS at 713-743-5858 for guidance on whether they can safely clean up any spill themselves.

Note: Waste from cleaning up hazardous material spills (including grossly contaminated PPE) must be treated as hazardous waste.

Describe the locations of the nearest emergency equipment, e.g., eyewash station, safety shower, first aid kit, spill kit, etc.

Describe how laboratory personnel should handle accidental exposure to the chemical(s). Consider:

* Stoppage of work and leaving the immediate area for inhalation hazard concerns.
* Removal of contaminated clothing and/or PPE.
* Flushing with emergency eyewashes for eye contact, and safety showers for body contact.
* Describing if special emergency equipment is needed. E.g., a Class D fire extinguisher is needed for flammable metals.
* Contacting [Student Health Center](https://www.uh.edu/healthcenter/) at 713-743-5151 for medical advice on occupational chemical exposures.
* Calling 911 from a campus phone or 713-743-3333 from any phone or proceeding to the nearest emergency department in case of a medical emergency.
* Filling out a report of Work-Related Injury/Illness from [Risk Management](https://www.uh.edu/risk-management/workers-compensation/).

**5. Details of Process**

If this SOP is for a process, describe the overall process in as much detail as possible.

**6. Training of Personnel**

All UH laboratory personnel are required to complete the General Laboratory Safety Orientation and shall read and fully adhere to the [UH Chemical Hygiene Plan](https://uh.edu/ehs/labs/chemical-safety/chemical-hygiene-plan/) and lab-specific chemical SOP when handling the chemical. Principal Investigator (PI) should ensure that laboratory personnel are trained, understand, and implement the procedures as directed in the lab-specific SOP. PI should properly maintain the Training Record Page, which can be found on each Chemical SOP template and Guideline.