**SOP for Handling Hazardous Chemicals (Overview)**

As per OSHA Laboratory Safety Guidance (29 CFR 1910.1450), all laboratories should develop and maintain Standard Operating Procedures (SOPs) for handling hazardous chemicals.

**Standard Operating Procedures (SOPs) for the Safe Handling of Hazardous Chemicals** are written instructions that describe how hazardous chemicals (or groups of chemicals) are managed in laboratories.

**Frequently Asked Questions:**

**Question:** Do I have to have an SOP for all chemicals in the lab?

**Answer:** No, an SOP is only required for hazardous chemicals. If a chemical is not hazardous, an SOP is not needed.

**Question:** What is considered a hazardous chemical?

**Answer:** As per Hazard Communication Standards (HCS), a hazardous chemical is any element, compound, or mixture that can cause a physical or health hazard.

**Question:** Where do I find information on chemical hazards?

**Answer:** Information on a chemical's hazards is found in Section 2, "Hazard(s) Identification," of its Safety Data Sheet (SDS). SDSs can be requested from the chemical manufacturer or downloaded from the internet or found on SciShield SDS database. Other recourses on chemical hazards: CAMEO chemicals, NIOSH Pocket Guide to Chemical Hazards (also available as a free phone app), OSHA's Occupational Health Guidelines for Chemical Hazards and Prudent Practices in the Laboratory (available as free online PDF). You can also reach out to OEHS for guidance.

**Question:** Do I need to have an SOP for each hazardous chemical in the lab?

**Answer:** An SOP can be written for each individual chemical or for a group of chemicals that are handled in the same way in the lab. Developing a single SOP for multiple chemicals with the same handling procedures is efficient. However, it's advisable to create separate SOPs for chemicals with unique or acute hazards.

**Question:** *What if I make the chemical in the lab and use it up in a single process*?

**Answer:** A separate SOP should be written outlining the process of preparation and the safe handling of all its components.

**Question:** If I follow the SDS, it seems like every chemical has hazards, sometimes exaggerated. Do I need to write SOPs for chemicals that are actually quite safe in practice but are considered hazardous according to the SDS?

**Answer:** The safety of lab members is our top priority, and compliance with OSHA regulations is essential. While the SDS provides important information on chemical hazards, we recognize that practical lab experience is also crucial. Principal Investigators (PIs) should use their expertise to determine when a separate SOP and training are needed for specific chemicals, typically those that are acutely hazardous or require special handling. For chemicals with similar handling procedures, a more general SOP may be sufficient. This approach balances regulatory requirements with practical safety considerations in the lab.

**Question:** Do SOPs need to be written in a specific format?

**Answer:** Although the OEHS does not mandate a specific format for SOPs, all SOPs must include a certain set of information, such as **Name of the Chemical(s); Hazards and Risks associated with the chemical(s); Procedures for Handling, Storage and Spills/Leaks/Accidents; Safety Measures (PPE, Engineering controls, etc.); Disposal Guidelines; Training Requirements (if applicable), Testing and Documentation (if applicable).**

Standardizing SOPs can be beneficial because it ensures consistency, making them easier to understand and follow, especially when training new lab members or ensuring compliance. OEHS has developed an SOP template (see below) that you can use as a guide to help streamline this process.

**Question:** Who is responsible for writing and updating lab-specific SOPs for the safe handling of hazardous chemicals?

**Answer:** The Principal Investigator (PI) and/or Lab Manager is responsible for developing and maintaining lab-specific SOPs. If the Lab Manager develops the SOP, it should be reviewed and approved by PI. The OEHS has developed a general SOP for Chemical Spill Response [link here], which outlines the approach to characterizing spills and the steps to take when a spill occurs. It is advisable to review and keep this SOP together with your lab-specific SOPs.

**Question:** If chemicals are stored but not opened or used (e.g., in a supply center), do I need an SOP for them?

**Answer:** Generally, an SOP is not required for chemicals that are stored but not opened or used. However, it is advisable to develop an SOP for handling potential incidents, such as spills or accidental releases. An SOP is needed only for hazardous chemicals if such incidents could create a hazardous situation.

**SOP for Handling Hazardous Chemicals** *(Template)*

|  |  |  |
| --- | --- | --- |
| **Date created/revised:** | **Department:** | **Room:** |
| **Principal Investigator:** | **DSR:** |

***Note:*** *Text in* Italics *is provided for your understanding and should be replaced with your lab-specific information.*

1. **Purpose:** This Standard Operating Procedure (SOP) describes the safe handling of hazardous chemical(s) in the lab.
2. **Responsibilities:** The Principal Investigator (PI) and/or Lab Manager is responsible for writing and updating lab-specific SOPs for the safe handling of hazardous chemicals and for training lab members. Lab members and students are responsible for reviewing the SOPs and adhering to the procedures outlined within them.
3. **Name of the Chemical(s):**

*List the* ***name of the chemical(s)*** *for which you will be describing the safe handling procedures. If possible, indicate the* ***CAS number*** *(Chemical Abstracts Service #), which can usually be found on the chemical's label. One SOP can cover multiple chemicals that require the same handling procedures. In such cases, list* ***all*** *the chemicals included in the SOP.*

1. **Hazards:**

*List the hazard(s) associated with the chemical(s), such as:*

***Flammable, Corrosive, Reactive and/or Toxic.***

*Include additional hazards, if applicable, such as:*

***Carcinogen, Embryotoxic, Pyrophoric, Water Reactive, Explosive, Peroxide Formers, Poisonous Gases, Lethal by Skin Contact or Inhalation, etc.***

*Consult the Safety Data Sheet (SDS) (Section 2) for detailed information on chemical hazards. Note: It is advisable to develop separate SOP(s) for chemicals with acute hazards.*

1. **Safety Measures (Engineering control, Containment Device, Administrative Controls, PPE):**

*List all necessary Personal Protective Equipment (PPE) that needs to be worn when handling the chemical(s), such as:*

 ***gloves (specify the type), lab coat (flame-resistant lab coat, if necessary), goggles, face shield, respirator, etc.***

*Additionally, list all Engineering Controls and/or Containment Devices used when handling the chemical(s), such as:*

 ***Chemical Fume Hood, Ductless Fume Hood, Radioisotope Fume Hood, Glove Box, Canopy Hood, Snorkel, etc.***

*If this chemical can be replaced with a less hazardous alternative, provide a list of potential substitutions.*

1. **Procedure for Handling:**

*Describe the procedure that needs to be followed for the safe handling of the chemical(s). This should include* ***step-by-step instructions on how to safely use and transfer the chemical****, as well as any specific precautions to minimize exposure and prevent accidents.*

*Specify* ***what should be avoided when handling the chemical(s)*** *to prevent hazardous situations.*

1. **Storage**

*Specify how the chemical(s) should be stored, including the appropriate* ***temperature, designated storage location (such as a flammable cabinet, acid cabinet, desiccator, etc.) secondary containment,*** *and any specific conditions required.*

*Provide a list of materials that are incompatible with this chemical and should NOT be stored together (if any).*

*If applicable, indicate the duration for which the chemical(s) can be stored safely.*

1. **Spills/Leaks/Accidents/First Aid Measures**

*Describe the* ***procedure that needs to be followed in case of a spill or accidental release of the chemical(s)****. The (OEHS) has developed a general SOP for Chemical Spill Response. Review this general SOP and keep it with the other SOPs. If there are specific procedures required for handling spills of this particular chemical, detail them here. If the general procedures in the OEHS SOP are sufficient, reference it here.*

*List first aid measures to be taken in case of exposure to the chemical(s).*

*List location of the nearest emergency eyewash station/safety shower and fire extinguisher.*

*List emergency phone numbers and what to do in case of medical issue due to exposure or who to contact if monitoring is needed.*

1. **Disposal**

*Describe the* ***process for disposing of the chemical(s) and any waste generated after using this chemical****. Information on the proper disposal methods for each particular chemical can be found in Section 14 of the Safety Data Sheet (SDS). However, it is highly advisable to* ***contact the OEHS at OEHS@tulane.edu for specific guidance*** *and to ensure compliance with regulations and institutional policies*

**10. Training**

*If handling the chemical(s) requires* ***specific training****, provide details about the training requirements, including the type of training, the responsible individual or group for conducting the training, and the frequency with which the training should be conducted. NOTE: OEHS provides general training on hazard communication and general chemical safety. The PI or laboratory supervisor is ultimately responsible for chemical specific training for his laboratory.*

**11. Testing and Documentation**

*Certain chemicals, such as peroxide-forming chemicals, require regular testing to ensure safety and prevent hazardous conditions, such as crystal formation.*

*If the chemical(s) for which the SOP is written require regular testing, describe the* ***procedure for testing and specify the materials used (e.g., test strips, analytical methods).*** *Outline the frequency at which these tests should be conducted to ensure safety and compliance.*

*Specify the type of* ***documentation*** *necessary to maintain records of these tests and explain how this documentation should be managed to ensure traceability and regulatory compliance.*