

Standard Operating Procedure

Laboratory Requirements for Chemical SOP(s)

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The Occupational Safety and Health Administration (OSHA) requires standard operating procedures covering health and safety considerations for any work with hazardous chemical in laboratories.

A standard operating procedure (SOP) describes how a laboratory will safely handle a hazardous chemical, including special handling procedures, engineering controls, and personal protective equipment (PPE).

Each Principal Investigator (PI) is responsible for conducting a hazard assessment for all work involving hazardous chemicals and ensuring that the appropriate SOPs are available and reviewed by laboratory personnel for their laboratories. Refer to CHE021.01-SOP-Controlling Risks of Chemical Hazards in Laboratories for additional information.

OPERATIONS REQUIRING PRIOR APPROVAL

Prior approval must be obtained from the Principal Investigator (PI) for designated activities that present specific foreseeable hazards to laboratory personnel. All laboratory workers must be trained in the safe use of designated chemicals and/or activities prior to beginning activities with them. Activities requiring prior approval include, but not limited to:

- Unattended Operations
- Working Alone
- Working with Particularly Hazardous Substances (PHS)
- Working with High-Risk Chemicals

GENERAL CHEMICAL SOP(s) & GUIDELINES

Environmental Health and Radiation Safety (EHRS) has developed general SOPs, chemical hazard guidelines and other EHRS published materials that provide general guidance and safety information for chemical and physical hazards commonly found in University Laboratories. These are located on the EHRS website and throughout the Chemical Hygiene Program and specify the minimum controls for the safe use of hazardous materials and equipment at the University. Many of these documents can be used in the format provided without modification by the lab. Requirements for laboratory-specific SOPs are indicated below.

LABORATORY-SPECIFIC SOP(s)

Laboratory-specific, customized SOPs must be created for chemicals or procedures that pose unique hazards, including all chemicals meeting the criteria for particularly hazardous substance (PHS), high-risk chemicals or when additional information on necessary actions that need to be taken to safely work with a chemical.

Circumstances requiring prior approval from PI, laboratory supervisor or instructor must be addressed in laboratory-specific SOPs. Laboratory-specific SOPs must be reviewed annually.

PARTICULARLY HAZARDOUS SUBSTANCES (PHS) & HIGH-RISK CHEMICALS

Particularly Hazardous Substances (PHS) and High-Risk Chemicals require additional planning and consideration. The table below includes the criteria for PHS and high-risk chemicals which necessitate additional requirement for SOPs. These requirements include establishment of designated area, use of containment devices such as chemical fume hoods or glove boxes, procedures for safe removal of contaminated waste and decontamination procedures.

Criteria for Particularly Hazardous Chemicals Based on GHS* Labeling-found in Section 2 of the SDS	
If the chemical has a hazard classification shown in red, it is also considered “high-risk”.	
Select Carcinogens	<ul style="list-style-type: none">• GHS*-Carcinogenicity Category 1A of 1B• IARC** Group 1• NTP's*** “Known to be Human Carcinogens”• OSHA-listed carcinogens• GHS Category 2 and IARC Group 2 (A or B), And NTP “Reasonably Anticipated to be Human Carcinogens”

Reproductive Toxins	<ul style="list-style-type: none"> • GHS Category 1A or 1B for reproductive toxicity
Chemicals Having High Acute Toxicity	<ul style="list-style-type: none"> • Acute toxicity by inhalation or dermal exposure GHS-Category 1 or 2 • Acute toxicity by oral exposure GHS category 1 • Specific Target Organ Toxicity-Single Exposure GHS category 1 • Skin or Respiratory Sensitizer-Category 1A • Strong Hydrogen Fluoride releaser • Corrosive to the respiratory tract
Reactive & Explosive Chemical Considered Particularly Hazardous (and High-Risk)	<ul style="list-style-type: none"> • In contact with water liberates toxic gas • Reacts violently with water • Pyrophoric liquid or solid-Category 1, or Pyrophoric Gas • Explosives-Unstable or Divisions 1.1.-1.3 • Explosives when dry, or Explosives with or without air contact • Self-reactive or Organic Peroxides-Type A • Self-heating Category 1 • Oxidizing liquid or solid GHS category 1 • In contact with water releases flammable gas GHS category 1 or 2 • In contact with acids liberates toxic gas • Pyrophoric liquid or solid GHS category 1 • Self-reactive or organic peroxides-Type B

*GHS=Global Harmonized System

**IARC=International Agency for Research on Cancer

***National Toxicology Program

FORMAT

The [Standard Operating Procedure \(SOP\) template](#) may be used to document laboratory-specific SOPs. Laboratories may use other formats if they include all the relevant information from all the sections included in the SOP template. In fact, EHRS encourages laboratories to incorporate safety procedures into their existing experimental protocols. If the protocol includes information for all the relevant sections from the SOP template in a user-friendly format, there is no need for a separate safety SOP unless it is useful to the lab for training purposes.

SOP-SPECIFIC TRAINING

All laboratory personnel using a specified chemical or process must be trained on the relevant general chemical SOP & guidelines, laboratory-specific SOP and this training must be recorded.

DOCUMENTATION

General chemical SOPs, laboratory-specific SOPs and applicable training records must be available to all laboratory personnel and upon request by EHRs, Regulatory agencies and other University personnel.