

# Standard Operating Procedure

A Standard Operating Procedure (SOP) is a written set of instructions that document how to safely perform work involving hazardous materials or hazardous operations. SOPs may focus on any of the following:

**Process** (e.g., peptide synthesis, distillation)

**Hazardous chemical** (e.g., carbon monoxide, perchloric acid)

**Class of hazardous chemical** (e.g., organic solvents)

Print out the completed SOP and keep a hard copy in the lab safety binder (an electronic copy should also be kept).

Attach MSDS for all chemicals used.

Date

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SOP Title

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Principal Investigator

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Building and Room #:

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Lab Phone Number:

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Section 1 – Process

List the process or type of process involving hazardous chemicals - for example, "atomic absorption spectroscopy for heavy metals." Include any unique equipment used. If the term "process" does not apply, proceed to Section 2.

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Section 2 – Hazardous Chemicals

List the hazardous chemicals (or class of chemicals) involved, including any hazardous products or by-products. Safety Data Sheets (SDSs) for all chemicals should be readily accessible. MSDSs for most chemicals are available through the chemical manufacturer or CHIMERA <https://rms.unlv.edu/msds/>or Chemwatch: <http://jr.chemwatch.net/chemwatch.web/account/autologinbyip>

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## Section 3 – Potential Hazards

Describe the potential dangers for each hazardous chemical for each element of the hazardous process or procedure by consulting the SDS. Include physical, health, and environmental hazards. Sigma-Aldrich has technical bulletins that provide detailed information about various processes, equipment and classes of chemicals

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## Section 4 – Approvals Required

List the circumstances under which a particular laboratory operation, procedure, activity requires prior approval from the Principal Investigator (PI), laboratory supervisor, or other personnel.

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## Section 5 – Designated Area

Consider establishing a designated area for this operation within the laboratory. A fume hood, portion of the laboratory, or the entire laboratory may be the designated area.

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## Section 6 – Special Handling Procedures and Storage Requirements

Describe special handling procedures and storage requirements including, (but not limited to): specific laboratory techniques; ventilation requirements; temperature controls; chemical incompatibilities; special containment devices; and access restrictions. If applicable, describe safe methods to transport the chemicals.

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## Section 7 – Personal Protective Equipment

List the PPE required for each activity or chemical. PPE includes gloves, laboratory coats, safety glasses, goggles, face shields, and respirators. If applicable, indicate the type of PPE (e.g., gloves, splash protection) needed for each phase of a process. For help with PPE selection or to determine if respirator use may be necessary, contact EH&S at 2-4347.

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## Section 8 – Engineering/Ventilation Controls

List any engineering controls used. An engineering hazard control is generally defined as equipment or physical infrastructure that reduces or removes hazards from the laboratory. It can include specifically selected and arranged experimental equipment. Common engineering controls include the fume hood, glove box, biosafety cabinet and laser interlock.

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## Section 9 – Spill and Accident Procedures

Describe procedures for handling potential emergencies related to this chemical or process such as accidental releases to the sanitary sewer, spills, fires, chemical burns to skin or eyes, shattered glassware, etc. **Note** the location of emergency equipment such as spill kits, emergency eyewash/showers, fire extinguishers, etc. Describe any special procedures for dealing with personal exposures (e.g., calcium gluconate should be used for HF exposures). Identify the location of emergency response phone numbers and emergency contact phone numbers.

## Section 10 – Waste Disposal

Describe any unique waste disposal procedures for the chemicals.

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## Section 11 – Decontamination

Discuss any appropriate decontamination procedures for equipment, glassware, and clothing.

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## Section 12 – Protocol

This section is for particularly complex or multi-step processes. List each step of the process or procedure chronologically and the corresponding process steps. List precautionary safety measures to be taken, including the use of specific laboratory techniques and PPE. If possible, describe indicators (visual or otherwise) which show whether the reaction, equipment, etc. is working safely as intended or that a hazardous situation may be developing.

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# Training Documentation

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