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| SLAC_Logo_hires_smallEnvironment, Safety & Health Division  | Chapter 58: [[Laboratory Safety](http://www-group.slac.stanford.edu/esh/hazardous_substances/labsafety/)](https://www-group.slac.stanford.edu/esh/general/general_policy/policies.htm) Laboratory Standard Operating Procedure Template Product ID: [642](https://www-internal.slac.stanford.edu/esh/docreview/reports/revisions.asp?ProductID=642) | Revision ID: 2491 | Date Published: 25 March 2022 | Date Effective: 25 March 2022URL: <https://www-group.slac.stanford.edu/esh/eshmanual/references/labsafetyTemplateSOP.pdf> | [docx](https://www-group.slac.stanford.edu/esh/eshmanual/references/labsafetyTemplateSOP.docx) |

All experiments that will be performed in a chemical laboratory must be discussed with the ESH coordinator and laboratory manager before starting work. In certain cases, formal written prior approval is required, at the discretion of the laboratory manager and ESH coordinator. Written prior approval will take the form of a written standard operating procedure (SOP) outlining steps and mitigations of the experimental process. The SOP must be approved at a minimum by the laboratory manager and ESH coordinator, and every worker performing the experiment must acknowledge that he or she is familiar with the SOP before starting work. The following is the recommended template for SOPs. Other formats are acceptable as long as all the required elements of an SOP are included. (See [Laboratory Safety: Chemical Hygiene Plan](https://www-group.slac.stanford.edu/esh/eshmanual/references/labsafetyReqCHP.pdf) [SLAC-I-730-0A09S-040].)

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| Procedure title |  |
| Procedure author |  |
| Date of creation / revision |  |
| Name of responsible person | Principal investigator and/or laboratory manager |
| Location to be performed | Building or lab number, beam line |
| Proposal number(s): |  |
| 1. | This standard operating procedure (SOP) is for a  |
| [ ]  Specific laboratory procedure or experiment Examples: synthesis of chemiluminescent esters, folate functionalization of polymeric micelles[ ]  Generic laboratory procedure that covers several chemicals Examples: distillation, chromatography[ ]  Generic use of specific chemical or class of chemicals with similar hazardsExamples: organic azides, mineral acids |
| 2. | Process or experiment descriptionBriefly summarize the process or experiment, including an estimate of how long the process takes and how frequently it will be conducted. Include total quantities (volume, mass) of the materials you to expect to use. |
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| 3. | Risk assessmentIdentify potential safety hazards. For chemical hazards, be specific (for example, flammability, corrosivity, reactivity/explosion, acute toxicity, or carcinogenicity).List OSHA hazards, NFPA ratings, and occupational exposure limits. |
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| 4. | Safety equipmentSpecify all equipment needed to perform research or experiment safely.  |
| 4.a. | Engineering / ventilation controlsExamples: fume hood use, explosion shielding, equipment interlocks |
| 4.b. | Personal protective equipment and other safety equipmentExamples: safety glasses, nitrile gloves, cryo gloves, absorbent bench paper |
| 4.c. | Location of nearest emergency safety equipmentExamples: organic azides, mineral acids |
| Item | Location |
| Eyewash / safety shower |  |
| First aid kit |  |
| Chemical spill kit |  |
| Fire extinguisher |  |
| Telephone | Telephones are located near the entrance to laboratories. |
| Fire alarm manual pull station |  |
| Safety stations |  |
| 5. | Shipping and receiving requirementsDescribe shipping or receiving requirements, especially for highly toxic, highly reactive/unstable, highly flammable, and corrosive materials.  |
| References: ESH Manual Chapter 52, “Hazardous Materials and Waste Transportation” (<https://www-group.slac.stanford.edu/esh/hazardous_substances/hazmattransport/>) |
| 6. | Designated areaWhere highly toxic, highly reactive/unstable, highly flammable, corrosive, or nanomaterials are used, identify the designated work area(s) and the necessary personnel decontamination after completion of work.  |
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| 7. | Step-by-step operating procedureProvide a sequential description of work, including details such as chemical concentrations and when special safety equipment is to be utilized. Include temperature, pressure, and other experimental conditions. Schematics or pictures are suggested for complex setups.  |
| 1. Step
2. Step
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| 8. | Special handling procedures, transport, and storage requirementsDescribe special handling and storage requirements for hazardous chemicals in your laboratory, especially for highly reactive/ unstable and highly flammable materials and corrosives. Describe transport and secondary containment requirements, between the laboratory and beam lines or between facilities. |
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| 9. | Beam line handling and storage requirementsDescribe sample handling procedures and sampling set up at the beam lines. Are samples sealed or open? Is ventilation required? Are heating, cooling, or gas distribution systems present? |
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| 10. | Emergency proceduresIndicate how spills, personnel exposure/injury, and other accidents should be handled and by whom. List emergency contact numbers. |
| **Life-threatening emergencies** (for example, fire, explosion, large-scale spill or release, compressed gas leak, valve failure) 1. Call 911.
2. Alert people in the vicinity and activate the local alarm systems.
3. Evacuate the area and go to emergency assembly point (EAP). *Indicate EAP here.*
4. Remain nearby to advise emergency responders.
5. Once personal safety is established, call ext. 5555 to activate internal response.
6. Provide local notifications.

Identify the area management staff who must be contacted and include their work and home numbers. This must include the PI and may include the safety coordinator and facilities manager. If personnel exposed or injured 1. Remove the injured/exposed individual from the area, unless it is unsafe to do so because of the medical condition of the victim or the potential hazard to rescuers.
2. Administer first aid as appropriate.
3. Flush contamination from eyes/skin using the nearest emergency eyewash/shower for a minimum of 15 minutes. Remove any contaminated clothing.
4. Bring to the hospital copies of safety data sheets (SDSs) for all chemicals to which the victim was exposed.

Non-life-threatening emergencies1. Call ext. 5555 to activate internal response.
2. Provide local notifications.

Identify the area management staff that must be contacted and include their work and home numbers. This must include the PI and may include the safety coordinator and facilities manager. If personnel exposed or injured 1. Call the SLAC Occupational Health Center at ext. 2281 for more information and to schedule an appointment.

For small spills / local cleanupIn the event of a minor spill or release that can be cleaned up by local personnel (personnel are authorized via work planning and control to handle spilled material, appropriate PPE is available, compatible spill response material is readily available in sufficient quantity, and cleanup is safe): 1. Notify personnel in the area and restrict access. Eliminate all sources of ignition.
2. Review the SDS for the spilled material or use your knowledge of the hazards of the material to determine the appropriate level of protection.
3. Wearing appropriate personal protective equipment, clean up spill. Collect spill cleanup materials in a tightly closed container. Manage spill cleanup debris as hazardous waste.
4. Submit [waste pickup request](http://www.stanford.edu/dept/EHS/prod/enviro/waste/pickup/WastePickup_form.htm) (<https://www-group.slac.stanford.edu/esh/forms/hazpickup.pdf>) to Waste Management.

**Building maintenance emergencies** (for example, power outages, plumbing leaks)Submit a Facilities service request (<https://slacprod.servicenowservices.com/self_service?id=facilities>) or call appropriate building manager.Identify the building manager using the SLAC Building Information database (<https://oraweb2.slac.stanford.edu/apex/epnprod/f?p=111:1>).  |
| Additional emergency procedures Describe additional, local emergency procedures. |
| 11. | Waste disposalIdentify amounts of waste anticipated and appropriate disposal procedures. Segregate waste by hazard class (for example, flammable, corrosive) and state (solid, liquid), label appropriately, and place in the laboratory’s hazardous waste cabinet. |
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| Additional waste guidelinesDescribe additional, local waste guidelines. |
| 12. | Training requirementsList the general and laboratory-specific training required |
| [ ]  ESH Course 128, Laboratory Safety Orientation ([ESH Course 128](https://www-internal.slac.stanford.edu/esh-db/training/slaconly/bin/catalog_item.asp?course=128))[ ]  ESH Course 105, Hazardous Waste Management ([ESH Course 105](https://www-internal.slac.stanford.edu/esh-db/training/slaconly/bin/catalog_item.asp?course=105))[ ]  ESH Course 161, Nanomaterials Laboratory Safety ([ESH Course 161](https://www-internal.slac.stanford.edu/esh-db/training/slaconly/bin/catalog_item.asp?course=161))[ ]  ESH Course 122, Pressure System Operator ([ESH Course 122](https://www-internal.slac.stanford.edu/esh-db/training/slaconly/bin/catalog_item.asp?course=122))[ ]  ESH Course 125, Pressure System Mechanic ([ESH Course 125](https://www-internal.slac.stanford.edu/esh-db/training/slaconly/bin/catalog_item.asp?course=125))[ ]  ESH Course 175, Cryogenic Liquids and Oxygen Deficiency Safety Training ([ESH Course 175](https://www-internal.slac.stanford.edu/esh-db/training/slaconly/bin/catalog_item.asp?course=175))[ ]  ESH Course 172, Compressed Gas Safety ([ESH Course 172](https://www-internal.slac.stanford.edu/esh-db/training/slaconly/bin/catalog_item.asp?course=172))[ ]  ESH Course 187, Working Safely with Hydrofluoric Acid ([ESH Course 187](https://www-internal.slac.stanford.edu/esh-db/training/slaconly/bin/catalog_item.asp?course=187))[ ]  Lab-specific orientation[ ]  Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Additional training requirementsList additional, local training requirements, such as equipment or technique training.1. Additional training requirement
2. Additional training requirement
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| 13. | Approval Standard operating procedures must be approved by the laboratory manager and directorate ESH coordinator. |
| Principal investigator **or** Laboratory Manager *(name, signature, date)*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Directorate ESH coordinator *(name, signature, date)*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Additional approvals List subject matter experts consulted for approval (name, title):1. Person consulted
2. Person consulted
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