

THE UNIVERSITY OF ALABAMA

1500 Warrior Drive
Tuscaloosa, Alabama 35487
(205) 348-5905

STANDARD OPERATING PROCEDURE TEMPLATE

| #1 | CONTACT INFORMATION: |
|---|--|
| Procedure Title | |
| Procedure Author | |
| Date of Creation/Revision | |
| Name of Responsible Person | <i>(The PI, Lab Supervisor, or Autonomous Researcher)</i> |
| Location of Procedure | <i>(Building and room number)</i> |
| Approval Signature | <i>(If required. See section #10 of this template)</i> |
| #2 | THIS STANDARD OPERATING PROCEDURE (SOP) IS FOR A: |
| <input type="checkbox"/> Specific laboratory procedure or experiment <u>Examples:</u> synthesis of chemiluminescent esters, folate functionalization of polymeric micelles, etc. | |
| <input type="checkbox"/> Generic laboratory procedure that covers several chemicals <u>Examples:</u> distillation, chromatography, etc. | |
| <input type="checkbox"/> Generic use of specific chemical or class of chemicals with similar hazards <u>Examples:</u> organic azides, mineral acids, etc. | |
| #3 | PROCESS OR EXPERIMENT DESCRIPTION |
| Provide a brief description of your process or experiment, including its purpose. Do NOT provide a detailed sequential description as this will be covered by section #6 of this template. Indicate the frequency and duration below. [TEXT IN RED FONT SHOULD BE DELETED-to insert your process or experiment description. You may also attach a separate sheet] | |
| Frequency: | <input type="checkbox"/> one time <input type="checkbox"/> daily <input type="checkbox"/> weekly <input type="checkbox"/> monthly <input type="checkbox"/> other: _____ |
| Duration per Expt: | _____ minutes; or _____ hours |

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| #4 | SAFETY LITERATURE REVIEW & HAZARD SUMMARY |
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1. List all physical and health hazards associated with the materials and procedures used in this SOP. **Examples of potential hazards include: toxicity, reactivity, flammability, corrosivity, pressure, etc.**
2. List all references you are using for the safe and effective design of your process or experiment, including safety literature and peer-reviewed journal articles. (may attach a separate sheet)

Suggested Safety References include:

For Safety Data Sheet <http://jr.chemwatch.net/chemwatch.web>

American Chemical Society. *Journal of Chemical Health and Safety*. Available online at <http://www.sciencedirect.com/science/journal/18715532>.

Furr, A. Keith. *CRC Handbook of Laboratory Safety*. Available online at <http://crcnetbase.com>.

Hall, Stephen K. *Chemical Safety in the Laboratory*.

Lewis, Richard J. *Sax's Dangerous Properties of Industrial Materials*. Available online at <http://www.knovel.com>.

National Oceanic and Atmospheric Association. CAMEO Database of Hazardous Materials. Available online at <http://cameochemicals.noaa.gov>.

National Research Council. *Prudent Practices in the Laboratory: Handling and Disposal of Chemicals*. Available online at <http://www.nap.edu>.

Pohanish, Richard P. *Sittig's Handbook of Toxic and Hazardous Chemicals and Carcinogens*. Available online at <http://www.knovel.com>.

U.S. National Library of Medicine. TOXNET Chemical, Toxicological, and Environmental Health Data. Available online at <http://toxnet.nlm.nih.gov>.

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| #5 | STORAGE REQUIREMENTS |
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Describe special handling and storage requirements for hazardous chemicals in your laboratory, especially for highly reactive/unstable materials, highly flammable materials, and corrosives. **[TEXT IN RED FONT SHOULD BE DELETED-to insert your storage procedure.]**

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| #6 | STEP-BY-STEP OPERATING PROCEDURE |
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[TEXT IN RED FONT SHOULD BE DELETED-to insert your operating procedure.]

1. **In the description for each step, include any step-specific hazard, personal protective equipment, engineering controls, and designated work areas in the left-hand column.**
 - a. **Guidance on Engineering and Ventilation Controls** – Review safety literature and peer-reviewed journal articles to determine appropriate engineering and ventilation controls for your process or experiment. Guidance is available from EHS, Prudent practices referenced above, and ChemWatch.
 - b. **Guidance on Personal Protective Equipment** - To assist with your PPE selection, refer to: EHS, Prudent practices, and ChemWatch Respiratory protection is required for lab research where appropriate engineering controls (such as use of a chemical fume hood) are not employed. For additional guidance on respiratory protection, consult with EHS, 205-348-5905.
 - c. **Designated work area(s)** - Required whenever carcinogens, highly acutely toxic materials, or reproductive toxins are used. The intent of a designated work area is to limit and minimize possible sources of exposure to these materials. The entire laboratory, a portion of the laboratory, or a laboratory fume hood or bench may be considered a designated area.

2. Describe the possible risks involved with failure to follow a step in the SOP in the right-hand column.

| Step-by-Step Description of Your Process or Experiment | Potential Risks if Step is Not Done or Done Incorrectly (if any) | | | | | | | | | | | | | | | | |
|--|--|--------|---|-----------------|-----------------------|--|---------------|-----------------|--------------------|-----------------|-------------------|-----------------|-----------|--|--------------------------------|-----------------|--|
| <p>1. Don personal protective equipment (PPE).</p> <p><input type="checkbox"/> appropriate street clothing (long pants, close-toed shoes)</p> <p><input type="checkbox"/> gloves; indicate type: _____</p> <p><input type="checkbox"/> safety goggles <input type="checkbox"/> safety glasses <input type="checkbox"/> face shield</p> <p><input type="checkbox"/> lab coats</p> <p><input type="checkbox"/> other: _____</p> | | | | | | | | | | | | | | | | | |
| <p>2. Check the location/accessibility/certification of the safety equipment that serves your lab:</p> <table border="1"> <thead> <tr> <th>ITEM</th> <th>STATUS</th> </tr> </thead> <tbody> <tr> <td>Laboratory Fume Hood/Glove Box or other Ventilation Control</td> <td>Location: _____</td> </tr> <tr> <td>Eyewash/Safety Shower</td> <td>Location: _____ <i>Ensure that it is accessible, not blocked.</i></td> </tr> <tr> <td>First Aid Kit</td> <td>Location: _____</td> </tr> <tr> <td>Chemical Spill Kit</td> <td>Location: _____</td> </tr> <tr> <td>Fire Extinguisher</td> <td>Location: _____</td> </tr> <tr> <td>Telephone</td> <td></td> </tr> <tr> <td>Fire Alarm Manual Pull Station</td> <td>Location: _____</td> </tr> </tbody> </table> | ITEM | STATUS | Laboratory Fume Hood/Glove Box or other Ventilation Control | Location: _____ | Eyewash/Safety Shower | Location: _____ <i>Ensure that it is accessible, not blocked.</i> | First Aid Kit | Location: _____ | Chemical Spill Kit | Location: _____ | Fire Extinguisher | Location: _____ | Telephone | | Fire Alarm Manual Pull Station | Location: _____ | |
| ITEM | STATUS | | | | | | | | | | | | | | | | |
| Laboratory Fume Hood/Glove Box or other Ventilation Control | Location: _____ | | | | | | | | | | | | | | | | |
| Eyewash/Safety Shower | Location: _____ <i>Ensure that it is accessible, not blocked.</i> | | | | | | | | | | | | | | | | |
| First Aid Kit | Location: _____ | | | | | | | | | | | | | | | | |
| Chemical Spill Kit | Location: _____ | | | | | | | | | | | | | | | | |
| Fire Extinguisher | Location: _____ | | | | | | | | | | | | | | | | |
| Telephone | | | | | | | | | | | | | | | | | |
| Fire Alarm Manual Pull Station | Location: _____ | | | | | | | | | | | | | | | | |
| <p>3. <i>Describe the next step in the procedure.</i></p> | | | | | | | | | | | | | | | | | |
| <p>4. <i>Describe the next step in the procedure.</i></p> | | | | | | | | | | | | | | | | | |
| <p>5. Dispose of hazardous solvents, solutions, mixtures, and reaction residues as hazardous waste.</p> | | | | | | | | | | | | | | | | | |
| <p>6. Cleanup work area and lab equipment.</p> <p><i>Describe specific cleanup procedures for work areas and lab equipment that must be performed after completion of your process or experiment. For carcinogens and reproductive toxins, designated areas must be immediately wiped down following each use. [TEXT IN RED FONT SHOULD BE DELETED- insert your specific clean up procedure]</i></p> | | | | | | | | | | | | | | | | | |
| <p>7. Remove PPE and wash hands.</p> | | | | | | | | | | | | | | | | | |

A. Health-Threatening Emergencies (ex: fire, explosion, health-threatening hazardous material spill or release, compressed gas leak, or valve failure)

Call 205-348-5454 after hours for UAPD, indicate you are experiencing a lab emergency, and they must contact EHS (205) 348-5905

Alert people in the vicinity. (*If concern is great enough to warrant a building evacuation activate the local alarm.)

Evacuate the area and go to your Emergency Assembly Point (EAP): **Indicate EAP here.**

Remain nearby to advise emergency responders.

Once personal safety is established, call Emergency contacts listed on lab signage

Provide local notifications:

Identify the area management staff that must be contacted including their work and home numbers. This **MUST** include the principal investigator and may include the lab safety coordinator, facilities manager, and/or business manager. **[TEXT IN RED FONT SHOULD BE DELETED- insert your specific emergency procedures]**

If personnel is exposed or injured:

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.

Call 205-348-5454 UAPD if immediate medical attention is required.

Call 205-348-5905 to report the exposure to EHS.

Bring SDSs to the hospital for all chemicals the victim was exposed to.

If a university employee is injured on campus it must be reported to EHS (205) 348-5905 within 2 hours.

An OJI form must be completed and submitted: <http://riskmanagement.ua.edu/forms/oji-form.pdf> within 24 hours of the injury.

Lab-specific plan for personnel exposure or injury:

[TEXT IN RED FONT SHOULD BE DELETED- insert your specific emergency procedures]

For Spills such as:

A. Hazardous material spills or releases which have/will impacted/impact the environment (via the storm drain, soil, or air outside the building)

B. For a spill or release that is larger than 4L that cannot be cleaned up by local personnel

C. Or for a spill you are uncomfortable cleaning up

1. Contact EHS at 205-348-5905

2. Provide local notifications:

-Identify the area management staff that must be contacted include their work and home numbers. This **must** include the principal investigator and may include the lab safety coordinator, facilities manager, and/or business manager.

[DELETE TEXT IN RED FONT AND INSERT LAB SPECIFIC NOTIFICATION PLANS]

C. Small Spills/Local Cleanup:

In the event of a minor spill or release that can be cleaned up by local personnel using readily available equipment:

1. Notify personnel in the area and restrict access.

2. Eliminate all sources of ignition.

3. Review the spilled material's SDS as well as your knowledge of the hazards associated with the material to determine the appropriate level of protection.

4. Wearing appropriate personal protective equipment, clean up the spill.

5. Collect spill cleanup materials in a tightly closed container.

6. Manage spill cleanup debris as an unwanted chemical pickup via the EHS website.

7. Report the spill to your supervisor.

D. Building Maintenance Emergencies (e.g., power outages, plumbing leaks):

In an accident/incident, EHS or other responders will make the determination to contact building maintenance – if needed and once the area is secure.

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| #8 | Unwanted or Used Chemical Disposal: |
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Describe the quantities of unwanted or used chemicals you anticipate generating along with appropriate disposal procedures. Include any special handling or storage requirements for your disposal process. Contact EHS at 205-348-5905 for questions and additional guidance. Remember unwanted or used chemical disposal is submitted via the EHS website. *[TEXT IN RED FONT SHOULD BE DELETED- insert your unwanted or used chemical disposal plan]*

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| #9 | TRAINING REQUIREMENTS |
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General Training (*check all that apply*):

- General Safety & Emergency Preparedness
- Chemical Safety for Laboratories
- Other: __ (see list of academy training courses; also contact EHS for additional training inquiries) _____

Depending on the hazardous materials and processes you will be working with in this SOP, additional safety training may be required by the University, such as Compressed Gas Safety or Biosafety. *[TEXT IN RED FONT SHOULD BE DELETED- insert required training courses for this specific work]*

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| Location Where Records Maintained: | Location of training records |
|---|------------------------------|

Laboratory-specific training (*check all that apply*):

- Review of SDS for other chemicals involved in process/experiment
- Review of this SOP
- Other: _____

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|---|-------------------------|
| Location Where Records Maintained: | Location of SDS records |
|---|-------------------------|

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| #10 | PRIOR APPROVALS |
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You must seek prior approval from your principal investigator (PI) or lab supervisor if you plan to use highly toxic, highly reactive or explosive chemicals. High-risk chemicals and operations may involve highly acute toxic chemicals, carcinogens, reproductive toxins, and highly reactive materials. You should also consult EHS if your experiments involve high-risk chemicals and operations as special safety precautions may need to be taken. For additional guidance, see the Chemical Hygiene Plan. Your PI or lab supervisor’s prior approval may be documented by his/her signature in the Approval Signature section of this document.

[TEXT IN RED FONT SHOULD BE DELETED- insert approvals required (if necessary) prior to students beginning work]

| | | |
|-------------|------------------|-------------|
| Name: _____ | Signature: _____ | Date: _____ |
| Name: _____ | Signature: _____ | Date: _____ |

| | | |
|-------------|------------------|-------------|
| Name: _____ | Signature: _____ | Date: _____ |
| Name: _____ | Signature: _____ | Date: _____ |
| Name: _____ | Signature: _____ | Date: _____ |
| Name: _____ | Signature: _____ | Date: _____ |