**General Use Standard Operating Procedure (SOP)**

**Specific Target Organ Toxics (STOT)**

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*Globally Harmonized System Hazard Class: Specific Target Organ Toxicity, single or repeat exposure*

*Examples: Lead, Cadmium, Formaldehyde, Ethyl ether, Manganese sulfate hydrate, Mercury dichloride, Isoflurane, Phenol, Methanol*

**Note**: This SOP is intended to provide general guidance on how to safely work with specific target organ toxicity chemicals and only addresses safety issues specific to specific target organ toxicity chemicals. Other hazard classes may also apply. Review Safety Data Sheets (SDS) and refer to other general use SOPs relevant to the chemical you are working with. Contact the Principal Investigator/ Laboratory Supervisor or the WSU Chemical Hygiene Officer for questions concerning the applicability of any item listed in this SOP (OEHS: 313-577-1200).

**If the chemical of interest is a particularly hazardous substance or a high-risk chemical a lab specific SOP is required.**

# **Hazard Description**

This category of toxins refers to specific, non-lethal toxic effects on a target organ or biological system after single or repeated exposure to a substance or mixture. The health effects include impaired function, which may be reversible or irreversible and may be immediate or delayed. For chemicals classified as STOTs, route(s) of exposure and the target organs affected can be identified in safety data sheets. Exposure routes can occur by oral, dermal, or inhalation. Organs or organ systems that may be affected include: central nervous system; liver; kidneys; blood; skin; or lungs. Immediate effects may be respiratory irritation, drowsiness, dizziness, headache, nausea, or there may be no noticeable immediate effect at all. Long term health effects may include such things as neurological disorders, cancer, or pulmonary diseases, amongst other chronic diseases.

*(OSHA 1910.1200 App A Health Hazard Criteria)*

# **Control of Hazards – General**

* Conduct a hazard assessment to identify proper use and handling techniques, fire safety, storage, and waste disposal issues specific to the chemical being used.
* Purchase, dispense, and use the smallest quantity possible.
* Purchase the lowest concentration that will meet your research needs.
* Review chemical Safety Data Sheet (SDS) to understand chemical specific routes of entry, safety handling practices, and additional PPE that may be required.
* Use the lowest concentration and amount necessary to perform the work.
* Change gloves frequently to limit chemical breakthrough.

# **Engineering/Ventilation Controls**

* Use a properly functioning chemical fume hood if there is a risk of aerosol or dust production or when working with a mist, fume, gas, or vapor.

# **Personal Protective Equipment**

In addition to proper street clothing (long pants or equivalent that cover legs and ankles, close-toed non-perforated shoes that completely cover the feet), wear the following Personal Protective Equipment (PPE) when performing lab operations/tasks:

* Safety glasses (If splash potential exists, use goggles + face shield instead)
* Lab coat.
* Appropriate chemical‐resistant gloves.
	+ Refer to Section 8 “Exposure controls/personal protection” of SDS or a glove selection guide (e.g. [Ansell Chemical Protection Guide](https://www.ansellguardianpartner.com/chemical/home#hp)) to identify appropriate glove type.

# **Special Handling Procedures and Storage Requirements**

* Follow any substance-specific storage guidance provided in SDS documentation.
* Consult [PubChem](https://pubchem.ncbi.nlm.nih.gov/), [Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards](https://www.ncbi.nlm.nih.gov/books/NBK55878/), and other reference material for specific handling and storage requirements.

# **Decontamination Procedures**

* Decontaminate surfaces and clean-up spills promptly. Refer to the chemical SDS to determine an appropriate decontamination method.

# **Waste Disposal**

Consult SDS and OEHS Hazardous Waste Team for appropriate disposal.

Do not dispose of waste by dumping down a drain or discarding in regular trash containers, unless authorized in writing by OEHS. [Submit requests to OEHS](https://research.wayne.edu/oehs/forms/chem-waste) for waste containers, labels, and waste collection. Also, refer to the [OEHS Hazardous Waste Management web page](http://research.wayne.edu/oehs/hazardous/index.php) and [WSU Chemical Hygiene Plan](http://research.wayne.edu/oehs/pdf/chemical-hygiene-plan.pdf) for more information.

# **Spill procedures**

1. **Spills**

For hazardous material spills or releases which have impacted the environment (via the storm drain, soil, or air outside the building) or which cannot be cleaned up by local personnel due to size of spill, hazard level, or hazards are unknown:

* 1. Call WSU Police (313) 577-2222. Available 24 hours a day, 7 days a week.
	2. Evacuate the spill area
	3. Post someone or mark-off the hazardous area with tape and warning signs to keep other people from entering.
	4. Remain in the vicinity until emergency personnel arrive and provide them with information on the chemicals involved.

For additional information regarding spill response procedures, refer to the [OEHS chemical spill response guidelines](http://research.wayne.edu/oehs/chemical/spills), [WSU Chemical Hygiene Plan](http://research.wayne.edu/oehs/pdf/chemical-hygiene-plan.pdf) and [American Chemical Society (ACS) guide for chemical spill response](https://www.acs.org/content/acs/en/about/governance/committees/chemicalsafety/publications/guide-for-chemical-spill-response.html).

1. **Small Spills**

In the event of a minor spill or release that can be safely cleaned up by local personnel using readily available equipment (e.g. absorbent materials) and appropriate PPE:

* 1. Alert personnel in the immediate area of spill and restrict access.
	2. Eliminate all sources of ignition.
	3. Increase ventilation in area of spill (turn on fume hood and open sash, open windows). Vent vapors to outside of building only.
	4. Review the SDS for the spilled material, or use your knowledge, to assess the hazards and to determine the appropriate level of protection.
		1. **DO NOT** clean up spills requiring respiratory protection. Contact OEHS for help (313-577-1200).
	5. Choose appropriate personal protective equipment (e.g. goggles, face shield, chemical resistant gloves, lab coat or apron).
	6. Protect floor drains, sinks or other potential avenues of environmental release as much as possible. Make a dike around the outside edges of the spill using absorbent materials.
	7. For solid spills: Use a scoop and brush or other suitable non-combustible items to collect spilled material. Minimize dust generation.
	8. For liquid spills: Cover the liquid with appropriate non-combustible absorbent material (NO paper towel), working from the spill's outer edges toward the center.
	9. Collect spill cleanup materials using a scoop or other suitable items and place in a tightly closed hazardous waste container.
	10. After spilled material is removed, decontaminate surfaces with water or other appropriate solvent.
	11. Place all contaminated materials, including contaminated items such as gloves, in the hazardous waste container.
	12. Label waste container with completed hazardous waste tag (available from OEHS).
	13. Submit online [waste pickup request](https://research.wayne.edu/oehs/hazardous/chemical-waste.php) to OEHS.

# **Emergency Procedures**

**\*\*If medical attention required, call WSU police (313-577-2222) immediately\*\***

* **Fire Extinguishers** – Refer to section 5 of the SDS for chemical specific firefighting measures. Both ABC dry powder and carbon dioxide extinguishers are appropriate for most fires.
* **Eyewash/Safety Showers** – Depending on the chemical hazard type, an ANSI approved eyewash station and safety shower may be required, easily accessed, and available within 10 seconds travel time for emergency use. Instruct personnel on the locations of eyewashes and safety showers, and how to activate them, prior to an emergency. Refer to [MIOSHA Fact Sheet: Eyewashes and Safety Showers](https://www.michigan.gov/documents/lara/lara_miosha_cet0199_628109_7.doc) to determine if an eyewash/safety shower is required for your specific chemical.

Please note: Additional hazards present in the laboratory may require that an eyewash or safety shower be present. This emergency equipment is required for treating exposures to workplace hazards such as chemical splashes, biological agents, welding sparks, metal shavings, or fine particulates like dust, dirt and sand.

1. **Health Threatening Emergencies**
	1. **Fire, explosion, health threatening hazardous material spill or release, compressed gas leak, or valve failure.**
		1. Call WSU Police (313) 577-2222.
		2. Alert people in the vicinity and activate the local alarm systems.
		3. Evacuate the area and go to your Emergency Assembly Point.
		4. Remain nearby to advise emergency responders.
		5. Once personal safety is established, call OEHS at (313) 577-1200.

Note: For compressed gas leaks, shut off gas supply only if this can be done safely, without risk to personnel.

* 1. **Injuries and Exposures:**
		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. Call WSU Police (313) 577-2222.
		3. Administer first aid as appropriate.
			1. Eye contact: Promptly flush eyes with copious amounts of water for a prolonged period (at least 15 minutes). Seek medical attention.
			2. Ingestion: Seek medical attention IMMEDIATELY. See first aid section of chemical Safety Data Sheet.
			3. Skin contact: Remove any contaminated clothing. IMMEDIATELY flush contamination from skin using the nearest emergency shower for a minimum of 15 minutes. Seek medical attention.
			4. Inhalation: Get to a source of fresh air. Seek medical attention.
		4. Call OEHS (313) 577-1200, to report the exposure and complete [Report of Injury](https://risk.wayne.edu/files/rofi.pdf) form.
		5. Bring to the hospital copies of the Safety Data Sheets for all chemicals to which the victim was exposed.
1. **Non-Health Threatening Emergencies**
	1. **Injuries and Exposures**

For injuries and exposures that are not considered serious or a medical emergency, visit:

Henry Ford Occupational Health – Harbortown

3300 East Jefferson, Suite 100

Detroit MI 48207

(313) 656-1618

Monday – Friday 8:00 AM to 6:30 PM

If Henry Ford Occupational Health Center is closed or for serious injuries, visit:

Henry Ford Hospital – Emergency Room

2799 W. Grand Blvd.

Detroit MI 48202

(313) 916-8742

OR

Detroit Receiving Hospital - Emergency Room

4201 St. Antoine St, Detroit, MI 48201

Phone: (313) 745-3000

# **Minimum Training Requirements**

1. **General Training:**
* Online through the [Collaborative Institutional Training Initiative (CITI)](https://about.citiprogram.org/en/homepage/).
	+ Laboratory Safety Training (general lab & chemical safety issues)
	+ Hazard Communication
* [Fire Safety](https://risk.wayne.edu/fire-safety).
1. **Laboratory Specific Safety Training:**
* [Laboratory-Specific Safety Training](https://research.wayne.edu/oehs/docs/lab-safety-training-checklist.doc) checklist
* Review of SDS for chemicals involved in process/experiment.
* Review of this SOP.
* Review [WSU Hazardous Waste Management](https://research.wayne.edu/oehs/hazardous/chemical-waste) guidelines.
* Other: \_\_\_\_\_\_\_\_\_

# **Laboratory Personnel Review**

Prior to initiating work, lab personnel using these types of chemicals must complete the table below confirming that they have read and understood the above SOP and the associated hazards.

| **Name** | **Signature** | **Date** |
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