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

**Hydrofluoric Acid (HF)**

CAS: 7664-39-3

Synonyms: hydrogen fluoride, fluoric acid, hydrofluoride, fluorine monohydride, fluorane

** **

*Globally Harmonized System Hazard Class(es):*

*Acute toxicity, Dermal (Category 1), H310*

*Acute toxicity, Oral (Category 2), H300*

*Acute toxicity, Inhalation (Category 2), H330*

*Skin corrosion (Category 1A), H314*

*Serious eye damage (Category 1), H318*

**Note**: This SOP is intended to provide general guidance on how to safely work with hydrofluoric acid. Review the Safety Data Sheet (SDS) and lab specific SOP for more information. 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).

**Hydrofluoric acid is a Specific High Risk Chemical (SHRC) and therefore requires a lab specific SOP approved by the WSU Chemical Safety Committee prior to initiation of work with this chemical.**

# **Hazard Description**

Hydrogen fluoride (HF) is a colorless fuming liquid or a colorless gas. The boiling point of HF is 67°F (19.4°C) at 760 mmHg. When hydrogen fluoride is combined with water it is known as hydrofluoric acid, a colorless liquid, which in low concentrations is visually indistinguishable from water. Concentrations of HF >40% fumes in air and presents unique hazards

Chemical Hazards

* Over time hydrogen fluoride/hydrofluoric acid corrodes metals, releasing flammable hydrogen gas.
* Hydrogen fluoride/hydrofluoric acid reacts with water or steam creating toxic and corrosive fumes.
* Hydrogen fluoride/hydrofluoric acid attacks glass, ceramics, concrete, some forms of plastic, rubber, and coatings.
* Hydrogen fluoride/hydrofluoric acid is very reactive with most bases, acids, and oxidants and therefore should not be stored near them.

Health Hazards

**DANGER:** ***HF is* *one of the most corrosive and potentially hazardous acids. Skin* e*xposures involving as little as 100 ml or greater than 25 in2 of body surface area may be fatal.* May be fatal if swallowed or inhaled.**

HF is an inorganic acid that is highly corrosive and lipophilic (readily penetrates deep into tissue, Figure 01). Once it penetrates the skin (or other tissues) HF slowly disassociates into hydrogen ion and fluoride ion and form calcium fluoride salt. Exposures can cause severe skin burns, deep tissue layer destruction, decalcification of bones, eye and soft tissue necrosis, and cardiac arrhythmias. With a high affinity for calcium (Ca), the fluoride ions from HF can lead to death by interfering with the metabolism and levels of Ca in the blood stream. Exposure routes include skin or eye contact, inhalation, and ingestion. Tissue damage and the degree of toxicity are determined by the acid concentration, the contaminated body surface area, and the duration of exposure.



Figure 01: Hydrofluoric acid burn. Mechanism of skin penetration and underlying soft tissue destruction via dissociation of the hydrofluoric acid molecule and formation of calcium fluoride salt [*McKee D, Thoma A, Bailey K, Fish J. A review of hydrofluoric acid burn management. Plast Surg (Oakv). 2014;22(2):95-98.]*

* Skin exposures to HF concentrations:
	+ >50% (considered a strong acid) - causes immediate and severe painful, throbbing burns with whitish discoloration of the skin which are slow to heal. Blisters often form.
	+ >20 and < 50% - may produce pain and swelling, but may not be felt for up to 8 hours following exposure.
	+ <20% - does not cause immediate pain but severe pain and serious injury can develop over 12-24 hours
* Eye exposure can cause destruction or opacification of the cornea which can result in blindness.
* Inhalation: HF fumes pose a severe upper respiratory threat. Severe exposure can cause nose and throat burns, lung inflammation, pulmonary edema, and other toxic effects including fatal hypocalcemia if not treated properly. Mild exposure can irritate the nose, throat and respiratory system; symptoms may be delayed for several hours.
* Ingestion can cause severe burns to the mouth, throat and stomach and may result in death. Even ingesting small amounts of dilute HF can cause profound and potentially fatal hypocalcemia and systemic toxicity unless medical treatment is immediately initiated.

**Any exposure to HF should be treated as a serious medical concern, requiring immediate decontamination and medical treatment.** See the Emergency Response section of this SOP for first aid response, which **MUST** be followed by an evaluation in a medical emergency room.

# **Control of Hazards – General**

* Conduct a hazard assessment to identify proper use and handling techniques specific to the procedure, fire safety, storage, and waste disposal issues specific to HF.
* Purchase and use the smallest quantity practical, at the lowest concentration of HF that will meet your research needs to avoid the need to dilute or manipulate the stock solution.
* Review the Safety Data Sheet (SDS) and HF emergency response procedures prior to beginning work.
* Verify your experimental set-up and procedure prior to use. Conduct a dry run.
* Ensure a sink, eyewash, and safety shower are immediately available and accessible.
* An HF-Specific Spill Kit and HF First Aid Kit must be immediately available in the area where HF work is being conducted. See the Spill Procedures and Emergency Response sections of this SOP for contents of the kits.
* Post [HF Warning Signage](https://research.wayne.edu/oehs/chemical/hf_warning_signage.docx) to equipment and areas where HF is being used and stored (available on OEHS website).
* Post this SOP next to the area where HF will be used, in case of emergency.
* Never work alone when working with HF. Work within sight and/or hearing of at least one other person who is familiar with the hazards of HF and first aid / emergency response procedures.
* Warn others in the immediate area when working with HF.
* Never pour water into acid; slowly pour acid into water.
* Do not use glass, metal, or ceramic containers with HF. Use Teflon, polyethylene or other compatible material.
* Avoid heating HF if possible.
* Do not submerge gloved hands into HF solutions. Use tweezers, cassettes, and other sample holders. Teflon and polypropylene are compatible materials.
* It is not recommended to wear contact lenses while working with HF.

# **Engineering/Ventilation Controls**

* Work with HF must be conducted in a certified chemical fume hood unless other controls are designated in the lab specific SOP. Sash height must be kept as low as possible to avoid escaping fumes and provide a physical barrier.
* Use bench paper to limit the potential for contamination of work surfaces in the event of a minor spill. Or place a polyethylene tray on top of the work surface to contain spills.
* Keep containers closed to minimize exposure and prevent etching of fume hood glass from HF vapors.
* Firmly clamp / secure vessels (e.g. graduated cylinders, beakers) when transferring and working with HF.

# **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:

* Chemical goggles
* Face shield
* Chemical protective lab coat- Fully buttoned lab coat made with cotton, polyester or a blend of the two (e.g. [Workrite™ FR/CP™ Lab Coat](https://www.fishersci.com/shop/products/fr-cp-lab-coat-men-s/p-6771070))
* Chemical resistant apron [e.g. [Neoprene](https://www.fishersci.com/shop/products/pip-neoprene-apron/19810609),  [vinyl](file:///C%3A%5CUsers%5Csekanayaka%5CDesktop%5CWSU%20CSC%20meetings%5CWSU%20CSC%20February%2025th%202021%5C%20vinyl), or other chemical resistant ([Tychem](https://www.thomassci.com/controlled-environment/apparel-garments/disposable-garments/aprons/_/Tychem-QC-Apron-Chemical-Resistant-26-x-52?q=Chemical%20Resistant%20Apron))] and sleeves worn over lab coat
* If handling large quantities of HF (volume > 100 ml at concentration > 5%), chemical resistant foot protection is recommended in addition to acid resistant leg and body protection (either a coverall or leg protection plus sleeve apron). The leg protection should overlap the top of the foot protection on the outside so spilled acid cannot reach feet.
* Hand Protection
* DO NOT use latex gloves.
* DO NOT use gloves less than 6 mils thick.
* ALWAYS double-glove despite of the use of reusable or disposable gloves.
* MANDATORY to minimize the danger due to the potential for pinhole leaks.
* Can be a combination of reusable and disposable gloves.
* Reusable gloves should be placed over the disposable gloves.
* For safety, the inner glove must always have a cuff longer than the outer glove. Failure to observe this rule can result in liquid migrating to the inside of the inner glove if the outer glove develops a leak.
* Nitrile gloves are only safe to use as accidental splash protection with small quantities of HF (volume < 100 mL at concentration of < 5%).
* Butyl rubber, neoprene (polychloroprene), or neoprene/nitrile double layer gloves (reusable or disposable) are recommended. Refer to chemical resistance guides (see References section) to understand break-through times and permeation rates of the various glove materials. Refer to Table 01 below for examples of recommended gloves for HF acid work.
* Remove gloves using a technique which avoids touching the exterior surface.

Reusable Gloves

* + Thick (>8 mils), reusable gloves provide the most satisfactory protection and are MANDATORY when decanting concentrated hydrofluoric acid from stock bottles and for all work with concentrated acid (> 5%).
	+ Use reusable gloves with long cuffs which cover the ends of the lab coat sleeves. Ideally, gloves should extend to the elbow.
	+ When using reusable gloves with hydrofluoric acid, users SHALL:
		- Carefully check gloves for pinholes and damage before each use.
		- Thoroughly decontaminate the exterior of gloves by washing before removal.
		- Store gloves in a cool dark place away from mechanical hazards which may cause punctures.
		- Double glove.

Disposable Gloves

* All disposable glove materials provide time-limited resistance to penetration of hydrofluoric acid.
* Disposable gloves are NOT suitable for handling concentrated hydrofluoric acid >5% concentration. Thicker (>8 mils) reusable gloves are the preferred choice when permitted by ergonomics even for handling dilute hydrofluoric acid.
* Disposable neoprene or neoprene/nitrile double layer gloves only provide short-term splash protection against dilute hydrofluoric acid. When working with dilute hydrofluoric acid (≤5%), disposable gloves may be used for handling, with the stipulation that users SHALL:
* Use the thicker-grade disposable neoprene or neoprene/nitrile double layer gloves. DO NOT use Latex. Thin grade gloves < 6 mil thick shall NOT be used
* Use gloves with an extended cuff.
* Tuck lab coat sleeves into glove cuffs.
* Check gloves for damage before use.
* ALWAYS double-glove.
* Immediately change to fresh gloves once gloves become contaminated. Wipe-off splashes before removing contaminated gloves, to reduce possibility of transferring contamination to skin.
* Change disposable gloves frequently during an experimental procedure.
* Dispose of used gloves as hazardous chemical waste.

| **Glove Material** | **Disposable / Reusable** | **Glove Name and Product Specifications** | **Picture** |
| --- | --- | --- | --- |
| Butyl | Reusable | Honeywell Safety Butyl Gloves13 – 32 mil thickness11 – 14 in length | Butyl Gloves, Smooth Finish |
| Neoprene | Disposable | Kimberly-Clark Professional™ KleenGuard™ G29 Solvent Gloves9 mil thickness12 in length | Kimberly-Clark Professional™ KleenGuard™ G29 Solvent Neoprene Gloves |
| Neoprene | Reusable | SHOWA N8 30 mil, Unsupported Neoprene30 mil thickness18 in length | SHOWA N8 30 mil, Unsupported Neoprene, Chemical Resistant, 18" Glove, Best Glove |
| Neoprene/Nitrile | Reusable | Ansell AlphaTec® 53-001 Series Gloves15 mil thickness13 in length | Ansell AlphaTec® 53-001 Series Neoprene/Nitrile Combination Gloves |
| Nitrile | Disposable | Dura Flock® Flock-Lined Nitrile Gloves, Microflex®8 mil thickness10.5 in length | Dura Flock® Flock-Lined Nitrile Gloves, Microflex |
| Nitrile | Reusable | Sol-Vex® 37-185 Nitrile Gloves, Ansell22 mil thickness18 in length | Sol-Vex® 37-185 Nitrile Gloves, Ansell |

Table 01 - Recommended Gloves for HF Work. The gloves listed are just a few examples. Suppliers, such as Fisher Scientific and VWR International, offer a large selection of gloves which meet the criteria outlined in this SOP. For help in selecting an appropriate glove, it is recommended labs contact glove manufactures, such as Honeywell Safety or Ansell Guardian Partner.

* Respiratory protection: Avoid working outside of a chemical fume hood. If work must be conducted outside of a chemical fume hood, contact OEHS (577-1200) to evaluate your operations and to determine required respiratory protection. A respiratory protection program that meets MIOSHA requirements must be followed whenever workplace conditions warrant respirator use. Visit [OEHS Respiratory Protection](https://research.wayne.edu/oehs/health-safety/respirators) webpage for more information.

REMOVAL OF PPE: After clean-up and decontamination of the work area, remove PPE in the following order:

1. Outer gloves
2. Long sleeve acid resistant apron
3. Lab coat
4. Face shield
5. Chemical goggles
6. Inner gloves

Disposable items should be placed in a solid hazardous chemical waste container. Wash hands and forearms immediately after removing PPE.

# **Special Handling Procedures and Storage Requirements**

* All HF containers including HF waste MUST be clearly labeled and properly stored in a compatible secondary container (Teflon or polyethylene) and placed in a dedicated corrosive cabinet, away from all other chemicals.
* Transport corrosives in secondary containment, preferably a polyethylene or other non-reactive acid/solvent bottle carrier or closed container.

# **Decontamination Procedures**

Personal Protective Equipment:

* Upon leaving work area where HF is used, remove any PPE worn, and wash hands, forearms, face, and neck.
* Dispose all HF contaminated disposable PPE as solid hazardous chemical waste. DO NOT rinse HF contaminated disposable items prior to discard as hazardous waste.
* Thoroughly rinse HF contaminated reusable PPE with water, collect the rinsate as liquid hazardous chemical waste.

Chemical fume hood interiors, bench tops, equipment, and other laboratory surfaces where HF is used:

* Clean and decontaminate after each use.
* Visible HF contamination should be initially wiped off. Safely dispose HF contaminated wipes as solid hazardous chemical waste.
* After removal of visible droplets, remove any residual HF by thoroughly washing with copious amounts of water.
* If washing is not practical, wipe down with excess saturated sodium bicarbonate solution.
* Dispose all of contaminated materials (including rinsate) as hazardous chemical waste.
* Refer to equipment manufacturer to ensure compatibility of decontamination procedures.

# **Waste Disposal**

* Dispose of liquid HF and solutions containing HF as hazardous chemical waste in a tagged, closed, chemically-compatible container such as polyethylene placed in secondary containment.
* DO NOT combine HF waste with any other waste.
* DO NOT TO MIX HF-alcohol waste with HF-nitric waste as this will result in an explosion.
* DO NOT use glass, metal, or ceramic containers with HF.
* Collect contaminated disposable lab supplies as hazardous chemical waste. Dispose of empty containers as hazardous chemical waste.
* 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 of High Concern**

For any HF spills or releases which may;

* impact the environment (via the storm drain, soil, or air outside the building)
* noticeably fuming
* contain **any volume** of concentrated HF (concentrations >5%)
* contain dilute HF (≤ 5% concentration) that are > 2 mL
* occur in poorly ventilated areas
* OR involving additional hazard concerns
	1. Evacuate the spill area.
	2. Call WSU Police (313) 577-2222. Available 24 hours a day, 7 days a week.
	3. Safely post someone or mark-off the hazardous area with tape and warning signs to keep other people from entering.
	4. Safely, 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 (<2 ml) of Dilute HF (≤ 5% HF)**
* **DO NOT use spill cleanup materials to treat/decontaminate people exposed to HF acid** – Refer to Injuries and Exposures section listed under Emergency Procedures
* **DO NOT** use general chemical spill kits that contain Floor-Dri, kitty litter, or sand because HF reacts with silica to produce silicon tetrafluoride (a toxic gas).
* Use a HF specific spill kit assembled by the lab. NOTE: Upon request, an OEHS approved, commercially available HF neutralizer (with 1:1 neutralization ratio) will be provided to the lab free of charge. Please contact Chemical Hygiene Officer (313 993 6614) for more information.

**NOTE – Labs must keep track of the expiration date of the HF neutralizer provided by OEHS, and contact OEHS for a replacement two months prior to the expiration date mentioned on the neutralizer bottle.**

* HF specific spill kit assemble by the lab, MUST contain at minimum:
* chemical resistant shoe covers
* absorbent material (e.g. Folded paper towels)
* HF acid neutralizer provided by OEHS
* pH test strips or a pH meter
* polyethylene scoop or dust pan
* polyethylene or Teflon tongs
* Personnel cleaning up a HF spill must wear the required PPE listed in the PPE section of this SOP.
* To clean up a small spill or release by local personnel using the HF spill kit assembled by the lab and appropriate PPE:
	1. Alert personnel in the immediate area of spill and restrict access.
	2. **If your skin, eyes, or airways have been exposed to HF, medical treatment is the priority. Spill clean-up should then be left to another lab personnel familiar with safe HF spill clean-up procedures or OEHS emergency response group.**
	3. Remove and replace any contaminated PPE.
	4. 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.
	5. To neutralize the spill
1. Spray the neutralizer into the air surrounding the spill, then directly onto the

spilled acid to help reduce any vapors.

1. Gently pour and/or spray the neutralizer onto the spilled acid, working from the spill's outer edges toward the center.
2. The liquid hydrofluoric acid neutralizer will change colors in the presence of hydrofluoric acid from its original beige color to red and then back to beige indicating the neutralization process is completed to help identify the best time to handle the spill with the least amount of risk. NOTE: It is recommended that the pH of the neutralized liquid is also checked with a secondary measurement device such as a pH meter or paper to verify that neutralization of the liquid has occurred.
3. Once the spilled acid has been neutralized, use absorbent materials (e.g. C fold paper towels) absorb it.
	1. Collect spill cleanup materials using a polyethylene scoop/dust pan and tongs. Place spill cleanup materials in a tightly closed hazardous chemical waste container.
	2. After all visible spill cleanup material is removed, decontaminate surfaces following guidelines mentioned under decontamination procedures for Chemical fume hood interiors, equipment, and laboratory surfaces.
	3. Place all contaminated materials, including items such as gloves, in the hazardous chemical waste containers dedicated to collect HF waste.
	4. Label waste container with completed hazardous waste tag (available from OEHS).
	5. Submit online waste pickup request to OEHS.
	6. Report spill to supervisor or PI.

# **Emergency Procedures**

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

* **HF First Aid Kit**

Skin contact - 2.5% calcium gluconate gel (unexpired, unopened)

Eye contact - Rinse with copious amounts of water or saline;

Ingestion - Milk of Magnesia; chewable calcium carbonate antacid tablets.

HF First Aid Kits are commercially available.

* **Eyewash/Safety Showers** – An ANSI approved eyewash station and safety shower must be easily accessible, and available within 10 seconds travel time for emergency use when working with HF. Instruct personnel on the locations of eyewashes and safety showers, and how to activate them, prior to an emergency. The eyewash must be flushed on a weekly basis and documented using the [Emergency Eyewash Maintenance Log](https://www.google.com/url?client=internal-element-cse&cx=008693872176005135416:hd9kmpeywgi&q=https://research.wayne.edu/oehs/docs/eyewash-log-sheet.doc&sa=U&ved=2ahUKEwj-q5yxzb7tAhXQHc0KHT_1D_kQFjAAegQIABAB&usg=AOvVaw3S2C6UVaJo0jUoFeeUm5qf). Safety showers should be tested yearly by OEHS.
* **Fire Extinguishers** – Some foam based fire extinguishers will react with HF and release corrosive/toxic gases. For small fires involving HF, use a carbon dioxide or dry chemical fire extinguisher. If unsure about the type of fire extinguisher in your laboratory, consult with OEHS and the WSU Fire Marshall.
1. **Health Threatening Emergencies**
	1. **Fire, explosion, health threatening hazardous material spill or release.**
		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.
	2. **Injuries and Exposures:**
2. **Call WSU Police (313-577-2222) IMMEDIATELY** **and request an ambulance for anyone exposed** **to** **ANY AMOUNT OF HF**.
3. **Individuals aiding another worker exposed to HF MUST protect themselves by wearing two pair of HF protective gloves (nitrile or neoprene) and other safety equipment such as a lab coat and** **safety glasses.**
4. 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. Do not allow individual to remain in contact with liquid HF even if moving the person may expose the victim to addition risk
5. Until medical assistance arrives, administer first aid as appropriate. In order to prevent cross contamination, if possible the victim should perform the following actions on themselves:
* **Skin contact**: IMMEDIATELY flush all affected areas with water for 5 -10 minutes using the nearest sink or safety shower (depending on size and location of exposure). While flushing with water, remove all clothing, PPE or jewelry that could trap, or is suspected of contact with, HF.
	+ Any clothing that has to be pulled over the head should be cut off the body instead.
	+ REMOVE GOGGLES LAST. Quickly after rinsing with water, while wearing appropriate gloves, liberally rub 2.5% calcium gluconate gel onto all affected sites, applying fresh gel every 10-15 minutes, until medical assistance arrives. The affected areas do not need to be dried prior to applying gel. Reexamine the victim for any exposure / burn sites that have been overlooked. Do not apply analgesic, antibiotic ointment, or any other substance to the exposure site, except 2.5% calcium gluconate gel.
* **Eye contact**: Promptly flush eyes with copious amounts of water using an eyewash station for 15 minutes. If applicable, after washing hands remove contact lenses while flushing with water.
* **Inhalation**: Immediately move to a source of fresh air and call WSU Police (313-577-2222). DO NOT perform mouth-to-mouth resuscitation on a victim who is not breath, due to the risk of exposing yourself.
* **Ingestion**: Do not induce vomiting. Attempt immediate administration of fluoride binding substance which includes milk (1/2 to 1 glass-full), chewable calcium carbonate tablets [e.g. 12 TUMS(R) tablets (contain 200 mg each), 11 ROLAIDS CALCIUM RICH(R) tablets (contain 220 mg each), OR 8 TUMS EXTRA STRENGTH(R) tablets (contain 300 mg each) per dose] or milk of magnesia. Do not exceed 8 ounces (large amounts of liquid may induce vomiting) or liquid and stop if person becomes nauseated. The calcium or magnesium in these compounds may act as an antidote by binding fluoride ions. DO NOT administrate sodium bicarbonate. Never give anything by mouth to sedated an unconscious person.
1. Provide the following information to the EMS team and/or physician:
* HF Safety Data Sheet (SDS) and this SOP
* The concentration of the HF
* Body parts exposed, time of exposure, duration of exposure, and how it occurred.
* Summary of first aid measures given, including time when calcium gluconate gel/solution was first applied, and how many times it was applied in total.
1. Dispose of contaminated PPE, clothing and other items as hazardous chemical waste.
2. Within 24 hours of exposure, report the exposure toyour PI or manager and complete and submit a WSU [Report of Injury](https://risk.wayne.edu/files/rofi.pdf) form to the Office of Risk Management.
3. **Authorized Emergency Rooms**

Detroit Receiving Hospital - Emergency Room (**PREFERRED FOR HF EXPOSURES**)

4201 St. Antoine St, Detroit, MI 48201

Phone: (313) 745-3000

OR

Henry Ford Hospital – Emergency Room

2799 W. Grand Blvd.

Detroit MI 48202

(313) 916-8742

# **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) and 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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