

Chemical Hygiene Plan

Emergent Technologies Institute
Florida Gulf Coast University

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This Chemical Hygiene Plan (CHP) is written specifically for the *Emergent Technologies Institute*. It has two purposes:

1. To help protect faculty, staff, and students from health hazards associated with the use of chemicals in the laboratory.
2. To meet the requirements set by the Occupational Health and Safety Administration (OSHA), as specified in the Department of Labor's Code of Federal Regulations chapter 29 CFR Part 1910.1450.

This CHP is available for review by the students, faculty and staff of FGCU. Copies of the plan are located in 112B ETI building and can be obtained from Huan Luong, the Lab Manager. Office: 112B ETI building, Phone: (206) 271-6592.

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1. Designation of Responsible Personnel

This Chemical Hygiene Plan (CHP) consists of six sections; each section provides specific measures to help increase safety for the workers and students in our laboratory. The first part of the CHP is the list of people responsible for implementing and administering the Chemical Hygiene Plan.

The people with immediate responsibility for laboratory safety at ETI are the Director and Lab manager of ETI labs. They are responsible for developing, implementing, and updating the CHP.

ETI Director, Dr. Rosemary Higgins. Phone: (239) 590 – 7021.

ETI Laboratory Manager, Huan Luong. Office: 112B ETI building, Phone: (206) 271-6592.

Professors and Principal Investigators of ETI are responsible for guiding students with the safety requirements described in the CHP.

2. Standard Operating Procedures

Anyone who plans to work in any of ETI laboratories must follow the following guidelines.

Personal Apparel and Personal Protection:

Loose clothing and long hair must be neatly confined. All shoes must be of the “close-toes” types. Sandals are considered “open-toes” shoes and are not allowed in the lab. Please wear long pants in the laboratory, shorts are not permitted.

Eyes protection is a must when working in the lab. Safety glass with side shields is to be worn at all time. Do not work with any chemical without eye protection.

Lab coat must be worn at all time. They are available in the lab.

When working with potential high reactive chemicals, a face shield must be used.

Use appropriate gloves to avoid direct skin contact with lab chemicals. Make sure the gloves are new before using them. Change them periodically if needed.

Use Your Common Sense:

No mouth pipetting.

No horseplay in the lab.

No eating or drinking in the lab.

No smoking in the lab.

No cosmetics application in the lab.

Glassware Usage:

Avoid using damaged glassware.

Be extra careful when using vacuum glass apparatus such as Dewar flasks and other potential implosive glassware. Make sure they can withstand the vacuum before using them. When possible, wrap materials such as parafilm around them. This will minimize glass flying in case of implosion. The same care must be observed when pressure is applied to glassware. Do not use any glassware unless you know its pressure capability.

Working Alone In the Lab:

Avoid working in the lab when there is no one around. Make sure your colleagues know you are working alone. Ask them to check with you periodically. Students are not allowed to work alone in the week end.

Unattended Experiments:

It is not a “good laboratory practice” to leave an experiment unattended. However, if this is necessary, make sure there are automatic shut down controls to prevent fires or explosions. To prevent accident, place appropriate signs on or next to the experiment. The signs should have procedures for shutting the experiment down.

Emergency Eyewash and Shower:

Each ETI laboratory has an eyewash and emergency shower station. You must know exactly where these emergency stations are. Take time to locate these emergency stations. In an emergency, you will not have time to look for them. The emergency shower is located next to the lab entrance. The eye washing station is located on the right side of the furthest wall of the lab.

When use the emergency eye washing, make sure you continue washing your eyes for at least ten minutes or until all chemicals are clear from your eyes.

The same goes for emergency showering, do not turn the shower off prematurely, you must rinse the chemicals completely off your body.

Disposal of Chemicals and Other Lab Materials:

It is your duty to dispose chemicals and other waste materials properly. Dispose broken glasses in the broken glass bin; do not put them in the trash containers. All chemicals must be disposed according to their types. Do not put any chemical in the sink. Reactive chemicals used in research project must be disposed in separate containers. Each container must be labeled with the name of the chemical and the concentration (if possible).

Store waste chemicals in appropriate containers. If you have any question about chemical and method of disposal, call Environmental Health & Safety: 239-590-1414.

The lab managers will take care of all chemical disposal. Huan will contact EHS for all chemical pick up.

Working With Flammable Materials and Hot Materials:

When you are working with flammable chemicals, you must make sure there is no sources of ignition nearby, that can cause a fire. Hot plates are considered a potential ignition source and must be used with extreme care, particularly when flammable materials are present. You should only store your flammable chemicals in flammable cabinets.

Use appropriate tools such as tongs when working with heated glasses and metals. These materials usually remain hot for a long period of time. Do not pick them up with your bare hands, unless you know for sure they are cooled.

Chemical Spill and Emergencies

In a **Major chemical spill**, (when you need help from emergency personnel) take the following actions:

Evacuate everyone in the lab to a safe location, far from the area.

Account for all laboratory workers.

Call 911 for emergency assistance. If it is safe to do, turn off all sources of ignition, then leave the area.

Notify EH&S at 239-590-1414

Notify the ETI lab managers – Huan Luong: cell phone: 206-271-6592.

In a **Minor chemical spill**, (where you know you can handle it safely) take the following actions:

Notify all the people in the lab, and clear the area.

Identify the spilled material.

Notify Huan Luong at 206-271-6592, and let him clean up the spill.

In a **Fire Emergency**, take the following actions:

Immediately notify everyone in the lab, and evacuate the lab.

Pull the fire alarm switch in the hallway or call 911.

In case of a very small fire, use the fire extinguisher (only if you are trained).

If you are not sure, do not try to go back into the room, wait for professional help to arrive.

Notify EH&S at 239-590-1414

Notify the ETI lab managers – Huan Luong: cell phone: 206-271-6592.

In a **Medical Emergency**, take the following action:

If someone in the lab is injured, immediately call 911 for help. Do not wait!

If someone has symptoms of overexposure of a chemical, move her/ him out of the lab and call 911 right away. Immediately get the person to fresh air area.

In case of chemical contact of skin, flush the area with water for about 15 minutes. Do not hesitate to use the safety shower when needed. In case someone ingests a chemical, call 911. Drink large amount of water. Do not induce vomiting.

The following are the emergency contact numbers:

<u>Department:</u>	<u>If calling from a mobile phone:</u>	<u>Campus Line:</u>
Police - Emergency	911	1900
Physical Plant Department	239-590-1300	1300
Environmental Health and Safety	239-590-1414	1414

Chemical Storage:

All new chemical shipments must be delivered to the lab manager. He will label each chemical and record all information into the database, and he will deliver each chemical to the person who ordered it.

When a chemical container is empty, give it to the lab manager. He will update the chemical database and reorder it if needed. Do not throw any empty container in the trash.

DONOT STORE ANY CHEMICAL IN THE FUME HOOD!

Store all flammable chemicals in the flammable storage cabinets. If you have to store chemicals in a refrigerator, use the flammable storage refrigerator only. Don't store flammable chemicals in regular refrigerator; the automatic on/off switch inside the refrigerator is considered an ignition source.

Store all corrosive chemicals in a separate cabinet, preferably has a corrosive cabinet sign on the cabinet door.

Acids and bases must be stored in separate cabinets.

Do not store glassware or chemicals on shelves above work area, including the sink area. Do not leave chemicals on the floor unless they are in containers, ready for shipment.

Do not store liquids above eye level.

Material Safety Data Sheet (MSDS):

Each chemical in the lab has a material safety data sheet (MSDS). This is where you can find information about the physical and health hazards of that chemical. All MSDS sheets are kept in folders in the lab. If you are not sure about certain chemical, read the MSDS sheet.

3. Control Measures to Reduce Hazardous Chemical Exposure

Fume Hoods:

One of the main engineering controls to help reduce hazardous chemical exposure is fume hood optimization. A fume hood is a three-sided enclosure with an adjustable window in front. The idea is to draw the fume inward and away from the area immediately surrounding the lab worker. As a result, the airflow into the hood from the outside must be adjusted to fall within certain standard. NFPA (National Fire and Protection Agency) recommends fume hood face velocity of 80-120 fpm. To achieve this range, we measured the flow of air and marked the side of each fume hood. Laboratory workers should not raise the sash above this mark when using the fume hood. Open the sash above this mark will compromise the face velocity recommendation.

Chemical Storage Cabinets:

Special chemical storage cabinets are available in the lab. All lab workers should use these chemical cabinets for storing special chemicals. Use flammable cabinets and flammable refrigerator to store flammable chemicals. Use the corrosive cabinets to store corrosive chemicals. Use acid cabinets and base cabinets to store those chemicals separately.

Emergency Equipment:

Each of our labs is equipped with emergency shower and eyes wash equipments. As described in the SOP section, lab workers should know the locations of these equipments.

4. Protective Equipment

To minimize chemical exposure, lab workers should use necessary protective equipment. This means use safety goggles, face shields, gloves, and lab coats. When dry chemical dusts are present, use a dust mask or a dust respirator. When an experiment requires the use of volatile chemicals, do it in the fume hood. If you do

an experiment that requires the use of chemical respirator, you must notify the lab manager.

5. Safety Information

We want all lab workers to understand the hazards of laboratory chemicals. As a result, all lab researchers and students will be provided with information on the safe handling of chemicals when they are initially assigned to work in the lab. Go to DoGEE.org to access all lab safety information.

The Prudent Practices for Handling Hazardous Chemicals in Laboratory is a great resource for in-depth information on lab safety topics.

6. Activities Requiring Prior Approval

There are certain experimental procedures and chemical usages that require approval from either the lab manager or the professor in charge. The following is a list of activities that require pre-approval:

1. Experiment involves highly toxic chemicals.
2. The use of known genotoxins, reproductive toxins or carcinogens.
3. Experiment involves pathogenic microorganisms.
4. Unattended experiments.
5. Working alone in the lab.

Item 1, 2, and 3 of the above list require additional protection for laboratory workers. As a result, the lab manager and the professor in charge have to decide if the lab has the capability for doing these experiments. Pre-approval is a must in these cases.