



DEPARTMENTAL SAFETY PROCEDURES

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DEPARTMENTAL SAFETY PROCEDURES

University of South Florida Department of Chemistry

Introduction

All laboratories using or storing hazardous chemicals must have on hand a Chemical Hygiene Plan, that is read, understood and signed by all laboratory personnel. The USF Division of Environmental Health and Safety (EHS) provides a Chemical Hygiene Plan to each laboratory that can be further customized, and is available for download at:

<http://www.usf.edu/administrative-services/environmental-health-safety/laboratory-safety/>

Prior to beginning any laboratory work, the Principal Investigator (PI) must ensure that all laboratory personnel register with EHS by filling out a lab personnel registration form available at this website. This applies to undergraduate, graduate and postdoctoral researchers.

Personal Safety in the Laboratory

The Principal Investigator is responsible for ensuring that all laboratory personnel practice proper etiquette and safety in the laboratory, and have the necessary training and personal protective equipment for their work.

Training: All personnel working in laboratories are required to attend laboratory safety training (given by EHS) before beginning to work in the lab. Refer to <http://www.usf.edu/administrative-services/environmental-health-safety/laboratory-safety/lab-safety-training2.aspx>. Training must be updated annually by attending an EHS laboratory safety-training refresher course. In addition, PIs must provide their research personnel with specialized training on lab-specific hazards. Any researcher planning to work with biological, lasers, or radiological hazards, or with laboratory animals or human subjects, must also receive specialized training before beginning.

Working Alone: Personnel should never work alone where hazardous chemicals are being handled or stored. There should always be someone nearby who can provide assistance quickly if an accident occurs.

Laboratory Etiquette: The chemical laboratory is inherently a dangerous environment and all who enter and work in it must be properly trained and professional in work ethic. Personnel should be respectful of others and cognizant of safety hazards around them. Proper Personal Protective Equipment and clothing must be worn at all times.

Laboratory Clothing: Clothing should be worn to completely cover as much of your skin as possible. Long pants and long sleeve shirts are recommended to completely cover the legs, arms, and torso. Shoes should cover the toes and be made of non-permeable material. Open-toed and sandals are not acceptable for laboratory work. Hair, loose clothing or jewelry that might come into contact with chemicals or get tangled in equipment hold be tied back or secured. Lab coats are recommended but should be composed of material compatible with the chemicals being used (flame-retardant materials for working with flammables and pyrophoric reagents). *It is the PI's responsibility to provide this protection for their researchers.* Earphones or ear buds should never be worn when working in the laboratory (unless needed for the experiment or to provide protection from loud equipment), due to the risk of not hearing someone calling for help or a potentially harmful event occurring in the laboratory.

Eye Protection: Chemical splash goggles meeting the **OSHA approved, ANSI Z87.1** standard (imprinted on the goggle) for impact and splash protection must be worn over the eyes at ***all times in laboratories in which chemicals are stored or used.*** In situations where highly hazardous (corrosive, shock sensitive, explosive, toxic) chemicals are in use, a full face and neck shield meeting the ANSI Z87 standard should be worn in addition to goggles for complete protection. Although the wearing of contact lenses in the laboratory is not recommended, the National Institute for Safety and Health (NIOSH) suggests that those who do choose to wear contact lens while working with hazardous chemicals also wear suitable eye protection, and that written guidelines and a hazard assessment be done in advance and followed carefully.

Gloves: Gloves must be worn when handling hazardous materials, sharp, or very hot or cold items. Refer to a chemical glove compatibility chart to choose appropriate gloves specific to the material being used. The gloves should be inspected for tears or punctures before use and frequently while being worn. Know the limitations of the gloves you choose to wear- latex gloves are not suitable for work with hazardous chemicals. Refer to <http://www.usf.edu/administrative-services/environmental-health-safety/laboratory-safety/chemicals.aspx>

Food: ***Food and beverages must not be brought into or stored in laboratories.*** Eating, drinking and smoking are prohibited in the laboratories. Cosmetics should not be applied while in the lab.

Safety Data Sheets (SDS): Fire code requires that all laboratories must have up-to-date SDS for all chemicals used or stored in that facility, and be readily accessible at all times. It is advised that printed copies be kept near or within the Chemical Hygiene Plan binder, and that labs choosing instead to access SDSs online must ensure that the computer is always accessible for this purpose, and all research personnel know where to find them in case of any emergency. Laboratory personnel should read and understand the SDS for any chemical before using it for the first time.

Laboratory Equipment

Electrical Hazards: Any motor-driven electrical equipment cannot be used where flammables are present unless equipped with a non-sparking induction motor. Equipment with frayed cords or other damage must be taken out of service until repaired. All electrical connections must be properly grounded and use electrical cords approved for the current and voltage. No extension cords are permitted in the laboratory. Be aware of wet floors or wet hands when using electrical equipment of any type.

Refrigerators and Freezers: Any refrigerator or freezer used to store flammable chemicals must be rated as suitable for storage of such materials.

Hot Plates/Stirring Motors: Hot plates, unless designed as explosion-proof, cannot be used in conjunction with flammables in open containers that can splash or whose vapors can come in contact with the hot surface. Hot plates must not be covered with aluminum foil or any material that can disrupt temperature regulation of the plate.

Explosion/Implosion Risks: When there is the possibility of a reaction or procedure producing an explosion or implosion, the apparatus should be confined in a fume hood or portable safety shield. Vacuum lines and glass-lined thermos-style containers are highly prone to implosion, and must be carefully handled and outfitted with proper protective barriers.

Ovens: Wear thermal gloves when handling hot glassware from the ovens. Keep flammables such as volatile solvents away from the vicinity of hot ovens and surfaces.

Cryogenics: Cryogenic liquids and gases can cause severe burns, and must be handled with care. Insulated gloves should be worn when handling equipment containing refrigerants. Low-temperature vacuum traps may collect liquid oxygen if exposed to air, and can lead to explosions.

Radioactive Agents and Lasers: For research involving the use of radioactive isotopes or lasers, refer to <http://www.research.usf.edu/dric/radiation-safety/> for more information.

Diving, Biological Agents, Selected Agents, Animal Studies and Human Subjects: For research involving any of these, you must receive training and approval. Refer to the following websites for more information:

Diving: <http://www.research.usf.edu/dric/diving/diving.asp>

Biosafety: <http://www.research.usf.edu/dric/biosafety/>

Animals: <http://www.research.usf.edu/dric/iacuc/>

Human Subjects: <http://www.research.usf.edu/dric/hrpp/>

Safety Equipment

The Principal Investigator is responsible for ensuring that all laboratory personnel know the location and use of all safety equipment and the exits from the laboratory, as well as the proper maintenance of the safety equipment.

Eyewash Stations: The eyewashes should be flushed weekly and noted on the card. Nothing should be placed near or around the eyewash to block access.

Safety Showers: Safety showers should be checked routinely by Physical Plant. Access to the shower should not be blocked.

Spill Kit: Every laboratory must have a spill kit. Its location must be clearly marked on the laboratory doors and available to all personnel. The kit must contain sufficient types and amounts of materials to enable personnel to clean up a spill of the largest size container of any chemical in the lab. The spill kit must be replenished after each use and expired contents must be replaced immediately. For more information, see <http://www.usf.edu/administrative-services/environmental-health-safety/documents/labsafety-chemspillkit.pdf>

First Aid Kit: Every laboratory must have a first aid kit. Its location must be clearly marked on the laboratory doors and available to all personnel. The kit must be inspected periodically and its contents replenished as needed.

Fire Extinguishers: All laboratory personnel must know the location of the fire extinguisher in every laboratory, and trained to use it in an emergency. Access to the extinguisher must not be blocked. Those handling water-reactive agents, such as organometallics and pyrophoric substances, or electrical equipment, should have titanium oxide-based extinguishers available in case of an electrical or chemical fire.

Fume Hoods: Experiments that produce flammable, noxious, odiferous or toxic vapors must be done in an operating fume hood according to the manufacturer's instructions. EHS will periodically inspect the operation of the fume hoods.

Chemical Storage and Containment

- a. All laboratories must have a complete, accurate and up-to-date inventory of chemicals used or stored in that facility. Chemicals when received from a vendor must be entered into the Hazardous Inventory Tracking Systems (HITS). Chemicals that are used up or pass their shelf-life must be properly disposed of and removed from HITS. Refer to <http://www.usf.edu/administrative-services/environmental-health-safety/documents/hitstutorial.pdf>.
- b. Chemicals must be marked with a date when they are received and opened, and kept in preferably the same container in which they were received.
- c. Chemical containers must be clearly and accurately labeled.
- d. Liquids that can splash if the bottle falls and breaks must not be stored above eye level, and preferably no higher than bench top.
- e. Chemicals must be stored according to their chemical reactivity, as described at <http://www.usf.edu/administrative-services/environmental-health-safety/documents/labsafety-chemicalcompatibility.pdf>. Incompatible chemicals must be stored separately from each other.
- f. Flammables and corrosives should be stored in cabinets designed to hold them.
- g. All chemicals should be returned to storage when not in use.
- h. Many chemicals have limited shelf-life and must not be kept beyond the manufacturer's expiration date.
- i. Gas cylinders must be stored in an upright position, securely strapped or chained to a wall or bench top. Compressed gas cylinders must be capped when not in use or outfitted with an approved regulator.

Transfer and Transportation of Hazardous Materials

- a. Aqueous acids and reagents stored in glass bottles should be protected by bottle carriers during transport into or out of the laboratory.
- b. When transporting or moving gas cylinders, use a cylinder cart and be sure to cap the cylinder (do not move it with a regulator on it), and secure it tightly to the cart with a chain or strap.
- c. All pipetting must be done with a bulb or pump, never by mouth.

Reporting Accidents and Near Misses

In case of emergency, call 911 for immediate medical care for the injured or ill employee.

All other non-medical emergency injuries or illnesses are to be reported to **AmeriSys 1-800-455-2079**. The injured person should be present for the call.

All accidents, injuries, near misses and hazardous situations in the laboratory must also be reported to EHS at <http://www.usf.edu/administrative-services/environmental-health-safety/laboratory-safety/incidents.aspx>.

In the case of injury, Workmen's Compensation forms must be filled out within 24 hours. The forms can be downloaded from <http://chemistry.usf.edu/departement/policies/#Accident>

More information about laboratory safety can be found at <http://www.usf.edu/administrative-services/environmental-health-safety/laboratory-safety/index.aspx>

Signature Form

By signing this form, you acknowledge that you have received a printed copy of the Departmental Safety Procedures manual, and that you will adhere to the stated practices throughout your research and teaching in the Department of Chemistry.

Signature

Date

Printed Name and University Number

Please sign this form and give the original copy to Ms. Adrienne McCain for the departmental files.