

## **16. Departmental Safety Procedures**

### **University of South Florida Department of Chemical Engineering**

#### **Personal Safety**

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, 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. Contact lenses should not be worn in laboratories.

Clothing- Clothing must be worn which completely covers the entire leg from the waist to the ankle. Clothing must be worn which completely covers the torso from the waist to the neck. Shoulders must be completely covered and sleeves must be worn which cover the arm from the shoulder to at least halfway to the elbow. The wearing of lab coats and aprons is encouraged; however, the wearing of a lab coat or apron cannot be substituted for the wearing of proper clothing. Loose clothing that might come into contact with chemicals or get caught in apparatus or machinery must be avoided.

Footwear- Shoes must be worn at all times in the laboratory. The foot must be completely covered making open-toed or backless shoes and sandals unacceptable. Uppers made of woven material should not be worn.

Hair- Hair long enough to interfere with an experiment or become tangled in equipment must be tied back.

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

Gloves- Gloves should be tested for leaks before use and frequently during use. They should be discarded if found deficient. Know the limitations of the gloves you choose to wear. Latex gloves are usually not suitable for work with chemicals.

Fume Hoods- Whenever an experiment is likely to produce vapors that might exceed the permissible exposure limit for any chemical involved, the experiment must be confined to an operating fume hood.

Material Safety Data Sheets (MSDS)- Laboratories must have MSDS for all chemicals used in that laboratory available at all times. Laboratory personnel should read and understand the MSDS for any chemical before using it for the first time.

**Training- All personnel working in laboratories are required to attend laboratory safety training (given by Environmental Health and Safety every semester) before beginning to work in the lab. Training will be renewed and updated by attending the laboratory safety-training course every two years. If the worker might be exposed to specific hazards (biological, radiological, etc.) then they must receive training in the specific hazards unique to that lab before beginning to work there. Individuals who will work with cylinders of compressed gases must receive training in the proper use and handling of cylinders before being allowed to use them.**

Working Alone- Do not work alone in the laboratory. If you must work by yourself then arrangements must be made for workers in other labs to check on you periodically (every hour, at least).

Accidents- All accidents, injuries and hazardous situations occurring in the laboratory must be reported to the Safety Committee on the appropriate forms as soon as possible after the incident. In the case of injury to a state employee, Workman's Compensation forms must be filled out as soon as possible.

Safety Shields- When there is the possibility of a reaction or other procedure producing an explosion or implosion the apparatus used should be confined in a fume hood or within a portable safety shield.

#### **Chemical Safety**

## Storage

All laboratories must have a complete, accurate and up-to-date inventory of all the chemicals in the lab. Chemicals when received must be entered into the departmental chemical inventory database. When used up they must be removed from the inventory.

Keep chemicals in dated containers appropriate for them, preferably the same container in which they were received.

Chemical containers must be clearly and accurately labeled.

Liquid chemicals must be stored below eye level.

Incompatible chemicals must be stored separately from each other, following published guidelines.

Chemicals must be arranged for storage according to reactivity.

Flammables and corrosives should be stored in cabinets designed to hold them.

All chemicals should be returned to storage when not in actual use.

Chemicals must not be kept for long times in storage. Any chemical not in active use must be removed from storage and disposed of as waste.

Gas cylinders must be stored in an upright position, securely strapped or chained to a wall or bench top. When not in use cylinders must be capped.

## Transfer & Transportation

All pipetting must be done with a bulb or pump, never by mouth.

Glass bottles should be protected by bottle carriers during transport.

Gas cylinders must be capped and securely chained or strapped to a gas cylinder cart while being moved.

The bulk transfer or storage of flammables must be accompanied with the use of an electrical ground system.

### Disposal

Chemicals shall be disposed of as per Department of Environmental Health and Safety Regulations.

Please download these from the site: <http://usfweb.usf.edu/proced/EH&S/HWM.htm>

## Equipment

Emergency Equipment- Know the location and use of all safety equipment (eye wash, safety shower, fire extinguisher, spill kit, first aid kit) and the main and all alternate exits from the laboratory.

Spill Kit- Every laboratory must have a spill kit available. Its location must be clearly marked 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.

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

Refrigerators- Any refrigerator used to store flammable chemicals must be rated as suitable for storage of such materials.

Electrical Equipment- Any motor-driven electrical equipment cannot be used where flammables are present unless equipped with non-sparking induction motor. Hot plates, unless designed as explosion-proof, cannot be used in conjunction with flammables. Equipment with frayed cords or other damage must be taken out of service until repaired.

## Additional Safety Resources

For additional information, you may wish to investigate the following links

Material Safety Data Sheets

[www.msdssearch.com/DBLinksN.htm](http://www.msdssearch.com/DBLinksN.htm)

[www.msdonline.com/Home/](http://www.msdonline.com/Home/)

For more detailed Laboratory Safety information and other OSHA regulations for employers consult the following links.

USF Division of Environmental Health and Safety, CRS 104, 974-4036, Terry Dowdy, Director

<http://usfweb.usf.edu/proced/EH&S/safelab.htm>

OSHA Web Sites:

[www.osha-slc.gov/OshStd\\_data/1910\\_1450.html](http://www.osha-slc.gov/OshStd_data/1910_1450.html)

[www.osha-slc.gov/OshStd\\_data/1910\\_1200.html](http://www.osha-slc.gov/OshStd_data/1910_1200.html)

---

I acknowledge that these are the safety procedures that I will adhere to in research and teaching

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed