

SAFETY RULES IN THE GENERAL CHEMISTRY LABORATORY

Table of Contents

This section of the lab manual contains:

- Your First Assignment!
- Dress Code
- Safety Equipment in the General Chemistry Labs
- What to Do In Case of an Accident, Injury or Illness

Your First Assignments

The following is your first assignment in this course!

1. You must complete the laboratory safety quiz and give it to your lab instructor. (Use the quiz in your lab manual or print out the quiz on the Internet.) You cannot work in the lab until your instructor has received a successfully completed safety quiz from you. If you fail the safety quiz, or if you do not turn in the safety quiz, you will not be allowed to work in the laboratory at all. Any work missed due to the lack of a correctly completed lab safety quiz will earn a grade of "0."
2. You must read and sign the laboratory Safety Agreement and the Student Agreement after you have attended the Safety lecture and have watched the Safety videotape. You cannot work in the lab until you have signed these agreements.

Safety Rules

Please note: your laboratory instructor will reduce your grade or ask you to leave the lab if the safety rules are not followed!

1. NO food or drink in the lab, to avoid possible contamination.
2. Keep your hands away from your face, while working.
3. Wash your hands as often as possible, especially before leaving the lab.
4. Keep your workstation neat and clean.
5. Be well prepared before you come to the lab.
6. Know what to do in case of emergency.

Dress Code

If you come to the lab dressed inappropriately you will be asked to leave and you will receive a grade of "0" for the day's work.

1. **Wear splash-proof goggles or safety glasses at all times.** State and Federal law require the use of safety eyewear by anyone working in a chemical laboratory. The Department has approved splash-proof goggles or safety glasses with side shield for this purpose. Both types are available for sale.

2. **Tie back long hair.** Long hair can accidentally fall into flames or chemicals. Many hair sprays, gels, mousses, etc. are flammable! Think about this! Loose, long hair can also block your vision, which can lead to accidents.
3. **Do not wear clothing which is loose enough to knock over containers on the work bench or drag or dip into flames or chemicals.**
4. **Wear clothing (shirt, blouse, or dress) which covers and protects your chest, belly, sides, back, shoulders and upper arms.** No cutouts or cutoffs, tank tops, tube tops, muscle shirts, etc. No peek-a-boo belly buttons either! The skin of your torso must not be exposed at any time in the lab.
5. **Wear clothing (pants, very long skirt or very long dress) which covers and protects your body from the waist all the way down to and including your ankles.** No shorts are allowed. No short or mid-length skirts are allowed.
6. **Wear shoes which cover and protect your feet completely.** No sandals, flip-flops, open-toed shoes, or shoes with open sides or heels. And no slippers - the top of your foot must be covered!

Dress Recommendations

1. **Wear comfortable shoes.** Three hours of walking and standing on a hard tile floor can leave your feet very tired and sore if you wear uncomfortable shoes.
2. **Wear socks.** They offer added padding for your feet, and extra protection to your ankles.
3. **Wear clothing which "breathes."** The lab can get very warm. Wear cotton or another natural fiber to keep from overheating yourself in the lab.
4. **Wear clothing which you don't care too much about.** Tiny splatters or droplets of chemical are very likely to get on your clothing. You might not even know that the droplets are there. But the chemical can stain your clothes or weaken the fibers of the clothing so that the next time you do the laundry your clothes will come out of the dryer with little, fuzzy holes in them.
5. **Come prepared to change clothes.** If you do not want to spend the entire day dressed in your lab

SAFETY RULES IN THE GENERAL CHEMISTRY LABORATORY

clothes, then put your lab clothes in your book bag. Before lab class begins, you can go to a nearby rest room and change from your regular clothes to your lab clothes. It is also a good idea to have some spare clothes in case of an emergency.

6. **Do not wear valuable jewelry while working in the lab.** Chemicals which are harmless to your body may be capable of damaging jewelry. Take your jewelry off and store it in your purse or book bag before beginning any experiment.

Safety Equipment and How to Use It

1. **First Aid kit.** One first aid kit is located in each laboratory, at the middle bench, on the top shelf. It contains gauze squares, small, adhesive bandages and antibiotic ointment. If any injury occurs which cannot be handled with these supplies, then the student can be escorted to the Health Services office (SSB-210) to receive treatment from the health care professionals there, or can wait in the lab for an Emergency Medical Service (EMS) team from the Boca Raton Fire Department (BRFD) if the injury is severe.
2. **Broom and Dust Pan.** In the Chemistry lab we use a lot of glassware. Glassware usually winds up getting broken some time during the semester. When that happens, it is unsafe to pick up the broken glass with your hands. Instead, you should use a broom and dust pan to collect the broken glass. The broken glass should then be disposed of in the specially marked container provided (White cardboard box with blue lettering). There is a little broom for sweeping the bench top, and a big broom for sweeping the floor.
3. **Fume Hoods.** The fume hoods are large cabinets which have sliding glass doors in front. Fume hoods are used to protect you from harmful fumes, gases and odors. The fume hood has an air duct in its ceiling which is attached to a powerful fan. When the fan is turned on, the air in the fume hood is pulled up through the duct, carrying away any harmful fumes or smoke. Any time your experiment will produce harmful or bad-smelling gases or smoke, you will perform the experiment in the fume hood. Our fume hoods are on at all times, and they can only be turned off by authorized personnel. Our labs also include personal fume hoods at each bench. These are extremely small, and are not suitable for use with more elaborate experimental setups, but can be used for simple, small-beaker reactions which do not require the use of heating equipment. Your instructor can demonstrate the use of these fume hoods for you.
4. **Sink.** While the sink is used for cleaning glassware and many other tasks, it is also a part of our safety equipment. If you happen to get chemicals onto your hands or forearms, you must move quickly to the sink to rinse the chemicals off. The treatment for any chemicals which get on the body is to rinse the affected body area for 15 minutes under cold running water. When you are in the lab, if you notice that you have a mysterious itch on your arm which just won't go away, assume that it is a chemical on your skin and wash with soap and plenty of water.
5. **Safety showers and eye wash stations.** Safety showers and eye wash stations are located in each laboratory. When you are in the lab, make sure you locate the safety showers and eye wash stations and look very carefully at them. You should know where they are and how they operate *before* an accident happens.
6. **The treatment for any chemicals which get on the body is to rinse the affected body area for 15 minutes under cold running water (or as long as you can stand it).** If chemicals are splashed into your face they should not reach your eyes because you will be wearing safety goggles. If this sort of accident happens, *leave your goggles on* while you go to the eye-wash station. There you should wash your face with the goggles still on until you are reasonably sure most of the chemical is gone from your face. Then you should remove your goggles and wash again. If chemicals get into your eyes, you should call out for help. If you cannot see, someone will guide you to the eye wash station, where you should wash out your eyes thoroughly. You should blink continuously and rapidly while washing your eyes to aid the flushing action of the water. If chemicals get onto your body, you should quickly remove any contaminated clothing and rinse yourself off in a safety shower.
7. **Fire extinguishers.** There are fire extinguishers in each laboratory. While you are in the laboratory, please look carefully at the fire extinguishers. Notice how they are attached to the wall, and what you would have to do to get them off of the wall. Read the instructions on the side of the fire extinguisher so you will be familiar with their use. If you ever need to use a fire extinguisher, remember the following (A) pull the pin, (B) aim to the side at first, (C) depress the handle, (D) sweep the spray from side to side across the BASE of the fire (where the

**SAFETY RULES
IN THE GENERAL CHEMISTRY LABORATORY**

fire meets the fuel), not just at the flames! When the fire is out, clean up the area! *Note: Never spray a person with a fire extinguisher. The chemicals in the fire extinguisher can be harmful.*

8. **Fire alarm: If a fire alarm sounds you must evacuate the building!** There are alarm switches in the laboratory. It is unlikely that you will need to use them, since the laboratories are all equipped with several smoke detectors. But you should locate them and look at them so you know how they work. *Note: We will prosecute for intentional false alarms!*
9. **Gas shutoff valve.** Each lab has a master valve which shuts off the gas supply to the entire lab. If you cannot locate this valve, ask your instructor to point it out to you. This valve is especially useful in case of a fire in the lab. In case of a fire, students as well as instructors are authorized to shut off the room's gas supply.
10. **Nurse's Office.** The Nurse's Office is located near the Main Office on the first floor. The Nurse's Office can provide treatment for any minor injuries or illnesses. There are also trained medical personnel there whose advice may be useful. The Nurse's Office does charge students for treatment. Whenever a student goes to the Nurse's Office from the chemistry laboratory, the student must be escorted to make sure they make it to the SHS. Because the class must be supervised, the instructor will probably not be able to escort you personally. Another student or a teaching assistant will be assigned as escort.
11. **Telephone.** There is a limited access, emergencies-only telephone in the Chemical Preparations Room. This room is only accessible by Chemistry instructors and staff. If someone asks you to call for help, find a lab instructor (in the neighboring labs), professor or staff member and ask them to call 911. They will then call for an Emergency Medical Service (EMS) team from the Houston Fire Department (BRFD). Be sure to stay with that person until you have given all the necessary information (building, room number, what happened, etc.).

What to Do in Case of an Accident

Always tell your instructor about all accidents immediately!!!

1. **Broken glass.** Do not pick up broken glass with your fingers! Get a broom and dust pan. Sweep the broken glass into the dust pan and dump it into the specially marked containers provided in each lab.

2. **Small chemical spill.** Wipe up liquid spills with paper towels and dispose of them as your instructor suggests. Solids should be dissolved in water, if possible, and wiped up. Otherwise, sweep them up with a broom and a dust pan and dispose of them as your instructor suggests. In all cases, after the chemical spill has been wiped up, rinse the area with water to make sure that all residual chemicals have been removed.
3. **Large chemical spill.** Move away from the area of the spill. Warn the people around you LOUDLY. Call your instructor! Let the expert handle the clean-up!
4. **Chemical splash in your face, goggles on.** If the goggles have protected your eyes, DON'T TAKE YOUR GOGGLES OFF! Yell for help. Go to the eye wash station and rinse your face quickly with the goggles still on. Then remove the goggles and rinse your face again.
5. **Chemical splash or broken glass in your face, goggles off.** If this sort of accident happens, you may not be able to see well enough to go to the eye wash station on your own. YELL LOUDLY FOR HELP and cooperate with anyone who comes to your aid.
6. **Large splash of dangerous chemical on your clothing and/or body.** Quickly follow this procedure while continuously YELLING FOR HELP:
 - A. **Move away from the area where the spill occurred (you don't want to get more chemical on you).**
 - B. **CALL LOUDLY FOR HELP and to warn others to stay away from the spill!**
 - C. **Remove any contaminated clothing.**
 - D. **Use the safety shower. The treatment for chemical exposure is 15 minutes under cold running water.**
7. **Small, confined fire.** If you have a small fire in a container, (for instance, a small beaker full of alcohol has caught fire) find something you can use as a lid for the container. When the container is covered, the fire will quickly burn itself out. Call the instructor for help.
8. **Small, open fire.** If you have a small fire which is not in a container, move away from the fire and SHOUT FOR HELP! You can use a fire extinguisher to put the fire out. If you ever need to use a fire extinguisher, remember the following (A) pull the pin, (B) aim to the side at first, (C) depress the handle, (D) sweep the spray from side to side across the BASE of the

**SAFETY RULES
IN THE GENERAL CHEMISTRY LABORATORY**

- fire (where the fire meets the fuel), not just at the flames! When the fire is out, clean up the area!
9. **Large fire.** SHOUT FOR HELP and leave the area immediately! The fire alarm will probably sound. When it does, evacuate the building and TELL EVERYONE YOU CAN, where the fire is.
 10. **Your clothing on fire.** Don't run! It will only fan the flames and make the fire worse! Instead, you should **STOP** moving, **DROP** to the ground (lie down!), and **ROLL** on the ground to squash out the flames! **YELL** continuously!
Note: If you want to help a person who is in this sort of trouble, don't use a fire extinguisher! You must never use a fire extinguisher on a human being. The chemicals in the extinguisher can be harmful!
 11. **Fire Alarm. If a fire alarm sounds you must evacuate the building immediately!**
 12. To evacuate properly, you should quickly and calmly do the following:
 13. **Turn off all flames and unplug any hot plates or other electric equipment you are using.**
 14. **Get your stuff.** Take your book bag, purse, car keys, etc. with you. We never know whether the evacuation will last for 5 minutes or 5 hours. You don't want to become stranded on campus! **Walk calmly out the door, down the hall, down the stairs (elevators should not be used during an emergency unless you are handicapped), out the door and away from the building.**
 15. Your instructor should escort the class out of the building. Try to stay together as a class, and stay near to your instructor. If your class is allowed back into the building, you should finish your experiment, or at least clean up what you have left on the work bench. If the evacuation lasts beyond the end of the class period, then you are free to go.
 2. **Large cut.** Tell your instructor, and let your instructor look at the injury. To stop or slow down bleeding, apply pressure to the wound. If the wound is very large or there is glass or other foreign matter in the wound, then apply pressure around the arm or leg (between the body's torso and the injury) to slow the bleeding. In all cases, a large cut must be attended to by medical professionals! If you can walk, you may be escorted to the Student Health Services office (SSB 210). Or you may wait while an Emergency Medical Service (EMS) team from the Boca Raton Fire Department (BRFD) is called.
 3. **Small burn.** Tell your instructor, and let your instructor look at the injury. Chemical burns and heat burns should both be treated with lots of cold running water. *Never put anything but cold water on a burn!* Doctors often have to remove ointments because they retard healing! After this treatment, if the burn still hurts badly enough that you cannot complete the experiment then you will be escorted to the Student Health Services office (SSB 210) so the burn can be treated.
 4. **Large burn.** In all cases, a large burn must be attended to by medical professionals! Tell your instructor, and let your instructor look at the injury. Then you may be escorted to the Student Health Services office (SSB 210), or you may wait while an Emergency Medical Service (EMS) team from the Boca Raton Fire Department (BRFD) is called.
 5. **Fainting.** In all cases, an Emergency Medical Services team will be called! If you feel like you might faint, please ask for an escort to the Student Health Services office (SSB 210) before it is too late. You can usually lie down there, and you may avoid the expense of calling for emergency help.
 6. **Breathing difficulties.** In all cases, the student will be escorted to the Student Health Services office *if the student so chooses*. Otherwise an Emergency Medical Service (EMS) team *will* be called!

What to Do in Case of an Injury or Illness

1. **Small cut.** Tell your instructor, and let your instructor look at the injury. Wash the injury thoroughly with water. If the injury is minor, you may use the first aid kit in the laboratory. (The first aid kit contains triple antibiotic ointment and adhesive bandages.) If your injury still hurts so badly that you can't finish the experiment, then you may be escorted to the Student Health Services office (SSB 210) so the cut can be treated.