

Laboratory Course Safety Information

Skyline College Chemistry Department

Safety is our primary concern in the chemistry laboratory. We will be working with fire, toxic chemicals, glassware, and other hazards. It is your responsibility to work in a way that keeps you and your classmates safe. Be aware of laboratory dangers and work safely by following these guidelines:

Laboratory Guidelines on Personal Conduct and Safety:

1. ALWAYS wear safety glasses or goggles in the laboratory.
2. Come to lab prepared to perform the experiment. Complete required pre-lab assignments.
3. Arrive for lab on time, so that you may hear important safety information.
4. Do not enter the laboratory until your instructor arrives and allows you to enter.
5. Never work alone in the laboratory.
6. Wear sensible clothing in the lab. This includes fully closed shoes, long pants or skirts, and fitted clothing. Loose, flowing clothing and nylon or baggy jackets are a hazard and should not be worn. Shorts and short skirts do not adequately protect your legs from splashes or spills and may not be worn. Lab coats or aprons are a good idea to protect your clothing. Protect (and cover) your skin. Tie back long hair.
7. Keep the laboratory clean and avoid clutter. Place all things brought with you to lab (coats, bags, etc.) in the cubbyholes or under your lab bench.
8. Notify the instructor immediately of all spills. The instructor will tell you how it may be safely cleaned up.
9. Never leave an experiment unattended.
10. Never perform unauthorized experiments. Any changes in procedures must be approved by your instructor.
11. Notify the instructor immediately of all injuries or burns, no matter how minor.
12. No eating, drinking, smoking, or chewing gum is allowed in the laboratory. Tasting chemicals or mouth-pipetting is also not allowed.
13. Speak in normal conversational tones in the laboratory.
14. No horseplay and no running.
15. At the completion of your lab work, wash your bench top down, be sure gas jets are off, remove all solid matter from your sink, and put all equipment away.
16. Always wash your hands thoroughly before leaving the lab. You may have toxic chemicals on them or chemicals that can cause a rash.
17. Some chemicals and latex gloves can cause allergic reactions. Always be aware of this possibility and avoid contact with chemicals or inhalation of their vapors whenever possible.
18. Notify the lab instructor of any of the following:
 - You wear contact lenses.
 - You have a medical condition or concern that the instructor should be aware of.
 - You need special accommodations to work in the lab.

Laboratory Hazards and Proper Use of Equipment:

1. Fire in the laboratory

1. Gas burners are a constant burn hazard. Use caution around them. Never leave a lighted burner unattended. Always turn off gas jets when finished and check before leaving the lab so that gas fumes do not build up in the lab.
2. If your clothes catch fire, drop and roll on the floor to smother the flames. If you see someone with clothes on fire, use the fire blanket to smother the flames. The emergency shower may be used, if you are close enough. DO NOT use the emergency shower if clothes that are burning are doused with organic solvents. Notify the instructor immediately to arrange for additional first aid.
3. Small burns should be put under cold running water. Notify your instructor and ask for a bandage. Larger burns should be immediately brought to the instructor's attention, so that additional medical assistance may be obtained.
4. If you have a very small fire in a small container, smother it with a towel, watch glass or book (but not your hand).
5. If you have a waste paper basket - sized or sink fire, use one of the fire extinguishers in the lab.
6. In case of a large fire involving the lab itself, the room and building should be evacuated according to the following procedure:
 - Make others aware of the problem. Yell fire, pull the fire alarm lever to alert others.
 - Use common sense, if you can turn things off (particularly gas jets and electrical equipment) on the way out, do so.
 - Leave the room and get out of the building. Assemble in front of Building 7 so that your instructor may take roll to make sure everyone is out of the building.

2. Glassware:

1. Soft glass containers, such as bottles, funnels, and graduated cylinders should never be heated directly with a flame. They may shatter.
2. Check beakers, flasks and test tubes (which can be heated) prior to heating for chips and scratches. Chipped and scratched glassware can easily break. It should not be heated.
3. Hot glass stays hot for long time and you can't see the difference. Place hot glassware on an insulated metal screen (to warn others that it's hot). Let it cool for a considerable time before picking it up, and then, do so cautiously.
4. If you break glass, never touch the broken pieces. Notify the instructor and sweep up the pieces using the broom and dust pan. Use tongs or tweezers to pull glass out of the sink. Dispose of the glass in the designated container, not the trash can.

3. Handling Chemicals:

1. Read labels carefully. Be certain that you are using the correct substance.
2. Use only what is needed. Never return chemicals to their original containers. Share the extra with another student or ask the instructor how to dispose of it.

3. Leave chemicals in their proper places. Do not take the reagents to your workspace. Hold the bottle stopper in your hand while you pour (don't put the stopper onto the bench). Replace tops on bottles securely, and clean up any spills that may have occurred.
4. Label all chemicals that you take to your workspace. Grease pencils and labeling tape are available.
5. When mixing liquid chemicals with water, always add the concentrated chemicals to the water. Slowly add the chemical while mixing. Heat is generated when acid is added to water. Slowly mix in acid to water to avoid the solution boiling out of the container.
6. Use caution when heating liquids. Small quantities of liquid in test tubes can be heated safely in a beaker of boiling water. If you heat a test tube directly in a flame, you should:
 - use a test tube holder,
 - point the mouth of the test tube away from people,
 - move the test tube in and out of the flame slowly, heating the side of the test tube rather than the bottom to avoid "bumping" - the ejection of the liquid out of the tube.
7. Never heat flammable liquids with a flame. Use a hot plate or hot-water bath for this.
8. Exercise great care if you are directed to check for the odor of a substance. Use your hand to waft some of the vapor toward your nose. Never inhale deeply.
9. Chemical spills on the skin or clothing must be considered serious. If acids, bases (alkalines), or other corrosive materials come into contact with the skin, wash them off immediately with liberal amounts of water. Seek assistance from the lab instructor. If anything splashes in your eyes, use the eyewash at once and tell the lab instructor.
10. Carry chemicals carefully. Use two hands, one under the bottle, one on the neck or handle. Alert people that you are bringing the chemical through a crowded area.
11. When pouring liquid chemicals, pour from a smaller mouth to a bigger mouth vessel or use a funnel. Never return chemicals to a bottle, you may contaminate the entire amount.
12. If you spill liquid chemicals, you must clean up the spills. Follow your instructor's directions.
13. Always return bottle tops to the proper bottle and secure them firmly. Never pick up a bottle by its cap as a previous user may have put the cap on loosely.
14. Whenever toxic gases are evolved in an experiment, the work must be carried out in one of the fume hoods. Such gases include oxides of nitrogen and sulfur (NO_x , SO_x), the halogens (Cl_2 , Br_2 , I_2) and hydrogen sulfide (H_2S).
15. Mercury and mercury spills (from broken thermometers, etc) must be thoroughly cleaned up immediately. Notify your instructor. They will assist you with proper procedures. Never put broken thermometers containing mercury in any of the disposal containers in the lab.
16. Organic liquids must be handled with care. Some organic vapors are respiratory irritants, others are poison. Some of the liquids can be absorbed through the skin. Many organic liquids are flammable. Ask before disposing of organic compounds. Many are disposed on in a container labeled ORGANIC WASTE found in one of the ventilation hoods.

Disposal of Chemicals and Other Materials

1. Waste solids, such as paper towels, matches, filter papers and litmus paper should be discarded in the paper waste cans. Matches should be wet prior to dumping.
2. Your instructor will direct you in disposal of chemicals used in the experiments. Labeled waste containers will be provided for disposal of chemicals that may not be put down the drain or in the paper waste cans. Do not dump chemicals down the drain or into the waste cans unless instructed to.
3. Acids and bases must be neutralized before they are flushed down the drain, with lots of water.
4. Broken or disposable glassware should be placed in the container labeled for glass waste.

Using Electrical Equipment in the Laboratory

Electricity and liquids are a dangerous combination! Do not allow water, aqueous solutions, or other liquids to come into contact with electrical cords or electrical conductors. If your electrical equipment crackles, snaps, or begins to give off smoke, do not attempt to disconnect it! Call your instructor immediately.

Ventilation:

Our laboratories are ventilated through the four ventilation hoods (also called fume hoods) at the front of the room. The fan noise is easily noticed. Should these fans stop, the room should be evacuated. Turn off all gas burners, water faucets, and electrical equipment and leave the room. Your instructor will give further instructions. For certain experiments, you will be asked to work in one of the hoods. If any chemicals are being stored in the hood, be sure to ask your instructor if it is safe to work in that hood with the chemicals there.

Laboratory Safety Equipment:

In order to work safely in the lab, be certain that you are aware of the location of all of the following items in the laboratory:

- A. Eyewash station
- B. Safety shower
- C. Fire blanket
- D. Chemical Stockroom
- E. First aid kit
- F. Ventilation hoods
- G. Instructor's desk