



Eberly College of Arts and Sciences

C. Eugene Bennett Department of Chemistry

Safety Rules for Undergraduate Students in Chemistry Laboratories

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The following guidelines and policies are designed to protect students from exposure to hazardous chemicals in the academic laboratories. According to the Occupational Safety and Health Administration definition, a hazardous chemical is a chemical for which there is statistically significant evidence, based on at least one study conducted in accordance with established scientific principles, that acute or chronic health effects may occur in exposed persons. The safety rules will be enforced at all times by authorized departmental personnel. Students who do not follow the safety rules will be subject to dismissal from the laboratory.

I. Guidelines for Personal Apparel in the Laboratory

- A. Students must wear approved safety goggles (over regular eyeglasses) and approved laboratory aprons or cotton lab coats (not lab jackets) at all times in the laboratory.
- B. The use of contact lenses in the laboratory is strongly discouraged. In the event of a chemical splash or vapor release, contact lenses can increase the degree of injury to the eye and may prevent prompt first-aid and eye-flushing procedures.
- C. Students should wear cotton clothing that provides protection from chemical spills. Clothing which completely covers the legs must be worn at all times in the laboratory. Shorts and skirts that do not completely cover the leg are inappropriate apparel in the laboratory and are not permitted.
- D. To avoid exposure to hazardous materials, open-backed shirts, bare midriff shirts, or shirts which expose areas of the torso are not permitted.
- E. Wear shoes which completely cover the feet. Sandals, perforated shoes, open-toed shoes, open-backed shoes, or high-heeled shoes are not permitted in the laboratory.
- F. For your safety, hair longer than shoulder length and loose sleeves must be confined when working in the laboratory.
- G. Wear the disposable gloves that are provided in each laboratory when working with hazardous chemicals. Inspect the gloves for defects before wearing. Be sure to notify your teaching assistant if you have an allergy to latex. Remove gloves before exiting the laboratory. Upon removal, discard the disposable gloves in the waste basket.

- H. You are advised to avoid wearing synthetic finger nails in the chemistry laboratory. Synthetic finger nails can be damaged by solvents and are made of extremely flammable polymers which can burn to completion and are not easily extinguished.
- I. For your protection, jewelry should not be worn in the laboratory. Dangling jewelry can become entangled in equipment and can conduct electricity. Chemicals can seep under the jewelry and cause injuries to the skin. Chemicals can ruin jewelry and change its composition.

II. Procedures to Avoid Exposure to Hazardous Chemicals

- A. Minimize all chemical exposure. Avoid ingestion, injection, inhalation, eye contact, and skin contact with all hazardous materials in the laboratory.
- B. No chemical should ever be tasted. Do not pipet by mouth in the laboratory; use a pipet aid.
- C. When you are instructed to smell a chemical, you should gently waft the vapors toward your nose using your gloved hand or a folded sheet of paper. Do not place the container directly under your nose and inhale the vapors.
- D. Use the fume hood when there is a possibility of release of toxic chemical vapors, dust, or gases. When using the fume hood, the sash opening should be kept at a minimum to protect the user and to ensure the efficiency of the operation. Keep your head and body outside of the hood face. All chemicals and equipment should be placed at least six inches from the hood face to ensure proper air flow.
- E. If any chemical spills onto the skin, immediately flush the affected area with water and notify the teaching assistant.
- F. Eating, drinking, smoking, chewing gum, applying cosmetics, and using smokeless tobacco products are prohibited in the laboratory. Beverage containers, cups, bottled water, and food containers are not permitted in the laboratory. Never use laboratory glassware for eating or drinking purposes.
- G. Remove gloves before exiting the laboratory. Dispose of gloves in a waste basket, not in the solid waste container. Do not reuse gloves.
- H. Notify your teaching assistant if you spill any chemicals. Clean up chemical spills (including water) immediately. Do not leave spilled chemicals on the bench top or floor. At the termination of your experimental work, the desk top and student hood must be thoroughly cleaned before you leave the laboratory. The teaching assistant will advise you of the proper manner to dispose of the cleaning materials.
- I. Notify the teaching assistant about any sensitivities that you may have to particular chemicals prior to the start of the particular laboratory experiment.
- J. Due to possible contamination of laboratory coats with chemicals, students are advised that they should not wear laboratory coats outside of the Chemistry buildings and that they should not wash laboratory coats with personal clothing items.
- K. Always wash your hands at the end of each laboratory session before you exit the laboratory.

III. General Guidelines for Laboratory Procedures

- A. Do not enter the laboratory room without the supervision of your teaching assistant or the faculty member in charge of the laboratory. Working in the laboratory without supervision by the teaching assistant or the faculty member in charge is prohibited. The performance of unauthorized experiments and the use of any equipment in an unauthorized or unsafe manner are strictly forbidden.
- B. When diluting concentrated acids **always** pour the acid slowly into the water with stirring. Never add water to concentrated acids because of the danger of splattering.
- C. When cutting glass tubing, always protect your hands with a towel. When inserting rods, tubing, or thermometers into stoppers, the glass must be lubricated with soapy water or glycerol. Tubing ends must always be fire-polished. Make sure that the glass is cool before you touch it. Hot glass looks just like cool glass. Do not attempt to dry glassware by inserting a towel wrapped around a glass rod.
- D. Glass tubing should extend well through rubber stoppers so that no closure of the tube can occur if the rubber swells.
- E. All water, gas, air, electrical, and other service connections must be made in a safe and secure manner.
- F. Practical jokes, boisterous conduct, and excessive noise are prohibited. The use of personal audio and visual equipment is prohibited in the laboratory.
- G. Gas valves must be kept closed except when a burner is in use.
- H. Do not heat flammable liquids with a Bunsen burner or other open flame. If in doubt about the flammability of a liquid, consult your teaching assistant.
- I. Dispose of waste chemicals in the containers that have been provided and labeled for this purpose. Do not dispose of waste chemicals in the sinks or the waste baskets. Paper towels and gloves should be placed in the waste basket, not the chemical waste containers. Used filter paper and weighing dishes must be placed in the containers that are marked for this purpose.
- J. Examine all apparatus for defects before performing any experiments. Do not use damaged, cracked or otherwise defective glassware. Dispose of broken glassware in the containers provided in the laboratory. If you break a thermometer (or find a broken thermometer), report it to your teaching assistant immediately.
- K. Do not insert medicine droppers into reagent bottles unless they are specifically supplied with the bottles.
- L. Never return unused chemicals to the stock reagent bottles. Take only what you need. Use the quantities of reagents recommended in your laboratory manual. Do not waste chemicals.
- M. Do not remove stock reagent bottles from the dispensing areas without the permission of the teaching assistant or the instructor.
- N. All materials (i.e., chemicals, paper, towels, broken glass, stoppers, and rubber tubing) must be kept out of the sinks at all times to minimize the danger of plugging drains. Such items are to be kept away from positions where they might fall into the sinks or drains.
- O. Maintain clean glassware. When cleaning glassware with water, wash your equipment with tap water. Use distilled water only for rinsing. Do not use more distilled water than is necessary. Ethanol and acetone rinses must be placed in the appropriately labeled container in the laboratory, as instructed by the teaching assistant.

- P. Heavy pieces of glass apparatus and filter flasks should be supported with clamps suitably protected with rubber or plastic pads. Heavy pieces of glass apparatus that are not sitting directly on the bench top should have appropriate bottom supports, such as rings or tripods.
- Q. Coats, bags and other personal items should be stored in the proper areas; not on the benchtops or in the aisle ways.
- R. When heating or carrying out a reaction in a test tube, never point the test tube toward your neighbor or yourself.
- S. All containers containing chemicals or solutions of any kind that are retained between laboratory sessions must be labeled so that the contents can be identified by chemistry personnel. The label must also contain the date and the name of the responsible person.
- T. Caps must be kept firmly in place on all reagent bottles and waste containers when not in use.
- U. Return all of your equipment and glassware to your student drawer. Lock your drawer at the end of each laboratory session.
- V. At the end of the laboratory session, return all common equipment to the common equipment drawer. Do not place the common equipment in your assigned student drawer.

IV. Departmental and Institutional Laboratory Policies

- A. When the fire alarm sounds you must evacuate the building via the nearest exit. Extinguish all flames and turn off all equipment, as appropriate, before exiting.
- B. All personal injuries and illnesses, however slight, occurring in the laboratory must be reported immediately to the teaching assistant in charge of the laboratory.
- C. Report any accident (such as fires, explosions, a chemical spill, or the breaking of equipment) to your teaching assistant immediately.
- D. No chemical should ever be poured down the laboratory drains or placed in the waste baskets. Properly dispose of all waste chemicals in the containers that have been provided in the laboratories.
- E. Visitors, including children and pets, are not permitted to enter laboratory rooms.
- F. As a reminder of institutional policy, smoking is prohibited in all chemistry laboratories.
- G. Do not take laboratory equipment, glassware, or chemicals from the laboratory room without the permission of the teaching assistant.

