

*REVISED: August 2019*

**UNIVERSITY OF SCRANTON  
CHEMISTRY DEPARTMENT**

**LABORATORY SAFETY & PROTOCOL MANUAL**

**Emergency Phone Numbers**

University Police Department (Parking Pavilion).....570-941-7777  
Chemistry Stockroom (Loyola Science Center, Room 070)....570-941-7586  
CHEMTREC (Emergency chemical information).....800-262-8200

**All laboratories have an emergency call button located at the safety station. When the button is pressed it will call University Police Department. All labs have telephones that can call campus phones or outside phones. Always call University Police and not 911 for emergencies on campus.**

**I. PERSONAL SAFETY**

Safe practice is an **ATTITUDE** and a knowledgeable **AWARENESS** of potential hazards. Safety is a mutual responsibility and requires the full cooperation of everyone in the laboratory.

- A. Students are never allowed to work in the laboratory alone. Students must wait for their GTA before entering lab at the beginning of their scheduled period. If a student is found in any lab without proper permission, we will take up the matter with the department chairperson. **THERE WILL BE NO EXCEPTIONS TO THIS POLICY!**
- B. **CONTACT LENSES MUST NOT BE WORN IN OR ABOUT CHEMISTRY LABORATORIES.** All students will be required to sign a safety acknowledgement before performing experiments.
- C. **Appropriate lab attire** will provide maximum protection for the duration of the laboratory. No skin should be exposed other than the face (with the exception of eyes which will be covered with required goggles) and hands (with the exception being gloves must be worn when working with hazardous materials). The intent is that students are protected from spills, splashes, or broken glass that may fall from the bench or ricochet from the floor in the event of an accident.

Appropriate lab attire consists of:

- a. A full length **labcoat** that can be buttoned or snapped closed.
- b. Indirectly vented **safety goggles** that protect the eyes from splashes, clearly stamped on the goggle as meeting the ANSI Z87.1-2015 D3 splash safety certification. Safety glasses do not provide splash protection and are not allowed. UV rated goggles will have a U1 through U6 certification for UV use. Laser goggles are very specific to the laser in use and additional information is available.

- c. Long pants. Shorts, skirts, and cropped pants are not appropriate lab wear. Leggings may be worn provided the student covers the ankle area with socks. They may not be simply pulled down to cover the lower leg since they eventually ride up, exposing the skin.
  - d. Socks and shoes to cover the foot and any exposed skin. Sneaker socks do not provide protection. No open toe shoes or flip-flops are allowed for obvious reasons.
  - e. The appropriate glove will be used when handling chemicals. Nitrile gloves are provided in all labs for general protection. There are also other types of gloves, including chloroprene, available at the stockroom. Please check a compatibility chart when deciding which glove to wear. Always wash your hands after removing gloves. **Always remove gloves prior to leaving the laboratory at any time and for any reason.**
- D. Students must tie back **long hair** while performing laboratory work.
- E. **Hats** may not be worn while performing laboratory work.
- F. **Wash hands** often during the lab and wash again thoroughly before leaving the laboratory.
- G. Report all chemical spills, glassware breakage, fires and explosions to your instructor. An appropriate incident report will be filled out.
- H. If your clothing catches fire, **stop, drop and roll** on the floor. **Do not run** to the fire blanket or the shower.
- I. All broken glassware must be placed in the **broken glassware disposal receptacle**. The receptacles are labeled and are located in each laboratory. Never reach into a box to retrieve anything. Never overfill so glassware is protruding out of the top. Never slide your hand over the top cardboard because there is likely glass shards present. Goggles should always be worn when deposited glass into it.
- J. All non-biohazard syringes must be placed in the **sharps container** located in the laboratory. All biohazards must be placed in a red biohazard bag or a sharps container with proper labeling. Take to the stockroom for disposal.
- K. Be aware of the location of **safety equipment** in the laboratory. Such equipment includes hoods, eyewashes, safety showers, fire blankets, fire extinguishers, gas shut-offs, spill control materials and first-aid kits. Only use emergency equipment if you have been trained in its proper use. **The big red button on the safety panel will disconnect all power to the laboratory and physical plant will need to be notified for power reactivation.**

## II. IN CASE OF AN INJURY

A. Notify your instructor at once. **All injuries, no matter how small, must be reported and a department incident report must be filled out.** Your instructor will notify the stockroom personnel. Proper treatment or action will be taken to care for the injured until University Police or an EMS unit responds. All GTAs and Staff have been certified by the National Safety Council in CPR and First-Aid.

B. In case of a **bodily chemical exposure:**

- a. **Eyes:** Immediately rinse at an eyewash station for a minimum of 15 minutes with tempered water. The eyewash stations in the laboratory are located over select sink faucets. The only treatment for burning of the eyes and skin is flushing with copious amounts of water.
- b. **Extremities:** Immediately rinse for a minimum of 15 minutes using the sink faucet or drench hose if available.
- c. **Torso:** Immediately use the safety shower.

If your body is exposed to a chemical, remove all contaminated clothing. (There is no room for modesty in emergency situations. It could be the difference between life and death.) If your labcoat or other articles of clothing have become contaminated, these articles need to be decontaminated before leaving the lab. Thoroughly clean the articles outside of lab before reuse.

C. If you feel a burning sensation on your skin or in your eyes after lab, go immediately to the Student Wellness Center for evaluation. The Wellness Center is located at the corner of Mulberry St. and N. Webster Avenue (570-941-7667). If you need an escort, please call University Police.

## III. PREVENTION OF CHEMICAL INJURIES

A. **Chemical Reagents:**

- a. Read the reagent bottle label **twice!** Make certain that you have selected the appropriate chemical and concentration.
- b. Take note of the **NFPA** colored diamond located on the chemical label or the **GHS Pictograms** and any other hazards listed on the label. The diamond indicates the flammability, reactivity, health hazards and special requirements of the chemical.
- c. **Flammable liquids** (ethanol, methanol, ether, acetone, etc.) must be used in a chemical fume hood. Never use flammable materials outside the hood, especially in a room where an open flame is in use.

- d. Do not allow an **ethyl ether** bottle (anhydrous or technical) to become dry. Notify your instructor immediately if a dry bottle is discovered. Explosive **organic peroxides** may have formed. Please be informed of the other chemicals that can potentially produce organic peroxides.
- e. **Bottle top dispensers** may be used for dispensing liquids. Make sure you understand the proper use of these devices. **Serious injury could result if dispensettes are not used correctly.** A container of sodium bicarbonate solution should be placed under acid dispensettes to catch and neutralize any drips. Liquid reagents without dispensettes should be poured with reagent bottle labels facing opposite the receiving vessel.
- f. **Never taste a chemical.** Never smell a chemical directly. Always use your hand to waft the odor to your nose. Do not make physical contact with any reagent and avoid breathing vapors from reactions or open containers.

## B. Hazardous Waste

- a. Any material that is ignitable, corrosive, reactive, or toxic must be placed in a **Hazardous Waste Bottle** to be disposed of properly.
- b. The hazardous **waste bottle** will contain compatible hazardous waste and non-hazardous waste by-products that are named on the Hazardous Waste Label. A proper waste label will include the following:
  - i. Generator's Name
  - ii. All Contents with known percentages
  - iii. Physical Form ( Solid, Liquid or Other)
  - iv. Present Hazards (Warning or Danger statements, GHS Pictograms, or NFPA diamonds)
  - v. Satellite Accumulation Start Date (Local storage for maximum of 6 months)
  - vi. Waste Storage Room Start Date (Maximum of 6 months storage)
  - vii. The stockroom will not accept any overfilled bottles or any bottles that are contaminated on the outside
- c. Cautions:
  - i. Do not overfill waste bottles. Waste bottles should only be filled to the curve at the top. Tell your instructor if the bottle is at this level and they will provide you with a new bottle.
  - ii. Never place non-hazardous water-soluble powders in the municipal waste receptacles. These powders may be rinsed down the drain with plenty of water.
  - iii. **If you inadvertently dump a waste material into a reagent bottle, immediately tell your GA.**

For a more thorough explanation please refer to the "Hazardous Waste Guidelines" manual.

- C. **Safety Data Sheets** (SDS sheets) are available through a link on the My.Scranton.edu portal or directly at:

<https://msdsmanagement.msdsonline.com/company/364C070D-953C-4463-9AE7-F51E70E31D87>

A paper copy may also be obtained from the Chemistry Stockroom. They are a very good source of safety information including chemical characteristics, reactivity, compatibility, and permissible exposure limits (PEL's). Most chemical manufacturers allow free access to their SDSs on-line. **You should never work with a chemical without knowledge of its physical characteristics, toxicity or reactivity.**

- D. **Laboratory Safety Fume Hoods, exhausted outside** (Ducted Hoods)

- a. **Hoods should be used when working with most chemicals.**
- b. Turn on before using. There is one or more switches that control the hoods in the teaching labs. The research labs have switches on each individual hood. Please refer to the Phoenix Fume Hood manual for more instructions.
- c. **Check the alarm** to make sure the hood exhaust is operating within the expected parameters. The LED lights should be green or the digital monitors should be reading 100 CFM. **Never place your head inside a hood with chemicals.**
- d. Check **hood inspection** dates. There should be a yearly inspection label and a monthly check tag on the hood.
- e. Hoods work best with the sashes closed. If you must leave a sash open, never open more than approximately 18 inches; each hood is marked with recommended operating heights. **The vertical and horizontal sashes should never be opened at the same time.**
- f. **Never operate the hood with the sash locked open because the hood will not exhaust properly.**
- g. You should always use the furthest back part of the hood as possible to prevent any fumes from escaping the hood when you move your arm out of the hood. Make slow movements.

- E. **Miscellaneous Safety Tips**

- a. Always be aware of what your neighbor is doing. Inform your instructor if their actions indicate confusion or carelessness. Avoid distracting or startling other students.

- b. Never leave laboratory reactions unattended. Always dismantle apparatus before leaving the laboratory.
- c. **Broken thermometers** are a common accident in the laboratory. Most thermometers are non-mercury, but there may be exceptions. A broken mercury thermometer will carry an additional clean-up and disposal charge of \$20.00. By following the rules below, you can help prevent the breakage of thermometers in the lab.
  - i. Do not cool a hot thermometer by using cold water.
  - ii. Do not use the thermometer as a stirring rod.
  - iii. Never place thermometers near the edge of the tabletop. Triangular guards are available for the thermometers to prevent them from rolling off the bench top.
  - iv. **Thermometers fall out of their "holding" cases.** Be cautious when picking up thermometers inside a case; support the bottom end.
  - v. All laboratory equipment drawers should only have alcohol thermometers. If they break, inform your GTA immediately.
- d. Always use a pipet bulb or pi-pump to pipet liquids in the laboratory. **Never pipet any liquid by mouth.**
- e. Never heat a closed system.
- f. Wipe down your work area with a wet sponge before you leave the laboratory. Dry the area with a paper towel to prevent streaks. **Cleanliness of the laboratory** is an important safety consideration.

#### IV. MISCELLANEOUS

- A. All **medical conditions** that would affect the student's safety in lab should be reported in private to your instructor. This information can be helpful in an emergency.
- B. Students who have any concerns about the hazardous nature of materials in lab should inform their instructor or the laboratory supervisor. This holds especially true for **women of reproductive age, pregnant women, and women who are anticipating conception.** Safety Data Sheets will be provided for all chemicals used in the lab, so the student can consult with her medical physician to discuss the risks.
- C. The Chemistry Department does not permit friends in a lab to wait or watch.
- D. **Food** and/or **drinks** are never permitted in the lab.
- E. **Cell phone** use in the lab is strictly prohibited – they are a potential source of contamination and are certainly a distraction during the course of an experiment.

**It must be emphasized that no list of rules and regulations could cover every possible hazard in a chemical laboratory. The list provided here should only serve as a basic foundation. More detailed information may be obtained by consulting the University of Scranton's [Chemical Hygiene plan](#). Further Standard Operating Procedures (SOPs) should be obtained when working with lasers, animals, human subjects, biohazards, radioisotopes, carcinogens, and acute and chronic toxins.**

**Please refer to the *CRC Handbook of Laboratory Safety, 5<sup>th</sup> ed.* (ISBN 9780849325236) for additional safety information and regulations. The following references are also available in the LSC chemistry stockroom:**

**“Fundamentals of Laboratory Safety” by Willian J. Mahn, 1991**

**“Laboratory Safety – Principles and Practices”, 2<sup>nd</sup> ed, 1995**

**“Prudent Practices in the Laboratory, Handling and Management of Chemical Hazards”, 2011**

**The laboratory syllabus should be read for more detailed safety instruction. The information in the syllabus shall surpass what's contained in this document.**

**When in doubt about a particular procedure, ask questions before proceeding.**