



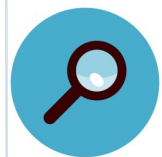
Special Edition: Chemistry Laboratory Safety

General Lab Safety Guidelines

Learn about the hazards of the materials you will be working with prior to beginning your experiment.



Safety Data Sheets are a good resource for hazard information. These can easily be found on the EHS website at ehs.yale.edu. PubMed and TOXNET from the NIH National Library of Medicine are also excellent resources for additional safety information on chemicals and other hazardous research materials.



Inspect your equipment before use and do not use any damaged equipment. This includes glove boxes, glassware, tubing, clips and personal protective equipment. Ensure your fume hood is operating correctly and position the sash appropriately to allow proper function, and reposition the sash if your fume hood flow alarm sounds. Do not work in the fume hood if the alarm is indicating low flow.



Always wear the appropriate PPE for the laboratory operation. At a minimum, safety glasses, lab coat and gloves must be worn when working with hazardous materials. Additional PPE may be required based on the work you are doing in the lab (see the [PPE Procedure](#)). Eye protection and clothing that covers the legs and closed toe, solid top shoes must be worn in any lab.



Before beginning an experiment, know where emergency equipment or supplies (eyewash, shower, fire extinguisher, spill cleanup material, etc.) are located and how to use them. Set up your experiment so that you can avoid awkward reaching or leaning into the fume hood. If needed, seek advice from your PI or a senior researcher.



Never work alone in the laboratory with high-hazard chemicals or perform high-hazard operations alone. Avoid working alone in the laboratory. If you need to work alone, follow the protocol for working alone set by your PI and let someone else know so they can periodically check on you.



Stop and ask your PI or a senior researcher if you need help or if something is not going the way you expect. Incorporate risk assessments when planning out experiments and re-assess risks when scaling up an experiment or changing chemicals in the procedure.

A Note to Researchers in Chemistry Laboratories

Laboratory research is an inherently hazardous activity and everyone involved in science research must always be alert and use extreme caution whenever working in the laboratory.

EHS has responded to serious and potentially serious accidents and incidents in science laboratories on campus.

Fortunately, no significant long-term injury or illness has resulted, and damage to the laboratories has been minimal. Causes for each accident have varied, but underlying causes in many of these accidents include failure to fully assess risks and failure to follow established procedures. Fatigue and stress are also contributors to many of these incidents.

Reporting of accidents and incidents, as well as near misses, has also increased. This has led to increased knowledge of potential hazards and ways to prevent future incidents, not only in the lab where the incident occurred, but also departmentally and campus-wide.

203-785-3555

Yale Environmental
Health and Safety's
Emergency Line is
available 24/7.

Preventing Accidents and Injuries in the Laboratory

Integrating safety into research creates a positive culture where safety is no longer just a compliance issue, but is an essential element in the daily work of laboratory research.

You can help prevent accidents and incidents from occurring in your laboratory by conducting a thorough risk assessment with your PI or a senior researcher before beginning a new procedure. The American Chemical Society recommends that researchers follow the RAMP concept:



- Use labels on bottles and containers to identify the most important hazards of the contents. Use Safety Data Sheets (SDSs) to identify Globally Harmonized System (GHS) hazards of the chemicals you will be using. These include physical, health and environmental hazards. The main hazard categories are flammables, explosives, corrosives, oxidizers, irritants and toxicants.

- Understand the nature of the hazard (its chemistry and/or toxicological/ biological effects).
- Identify the most important physical hazards from equipment, conditions and procedures. These include electrical and mechanical hazards and high or low temperature or pressure.



- Assess the risks presented by the most important hazards.
- Use SDSs and the GHS Hazard Categories and Statements to determine the relative risk of the hazards.
- Check to be sure all glassware and equipment are in good shape and working condition.



- Identify methods and safe practices to minimize the risks from exposures to chemicals and from physical hazards.
- Understand the nature and limitations of personal protective equipment, chemical hoods and other safety equipment.
- Locate online and printed materials to identify safe practices and consult with more experienced chemists.

- Wear required personal protective equipment.
- Use appropriate waste containers when discarding chemicals and be sure all ingredients are included on the waste tag.



- Know and practice the procedures for handling common emergencies such as spills, cuts, burns, exposures and fires.
- Understand emergency procedures with regard to each experiment.
- Ensure that all safety equipment, such as eyewash, fire extinguisher, first aid kit and safety shower, is present and in working order.

Source: American Chemical Society

Reporting Accidents and Incidents

EHS greatly appreciates that laboratories are now reporting accidents and incidents and strongly encourages everyone to report them in their laboratories when they occur.

As a reminder, for emergencies involving:

Hazardous Materials Spills

EHS Emergency Line at 203-785-3555

Fires

911

Minor Injuries or Exposures Not Requiring Immediate Medical Assistance

EHS Emergency Line at 203-785-3555 &
Yale Health Acute Care at 203-432-0123

Medical Emergency (Injury or Exposure Requiring Immediate Medical Assistance)

911

Near misses should also be reported. The student-run Chemistry Department Joint Safety Team has instituted an anonymous near-miss reporting system available at jst.chem.yale.edu. Consider filling out a near miss report on this system and review the database to learn from others' experiences. You should also alert your PI of all near misses. In addition, reporting near misses to EHS will allow us to help staff across campus learn from these experiences and reduce the possibility of similar incidents from occurring.

Yale EHS is also available to answer any safety-related questions or concerns at ehs@yale.edu or 203-785-3550.

Meet Your EHS Safety Advisor

EHS's Safety Advisor Program has a health and safety professional assigned to every building at Yale to provide a more personalized service in assisting you with health and safety issues.



Anna Kim is the Safety Advisor assigned to CRB, KCL and SCL. She can be reached at anna.kim@yale.edu.

Kim Heard is the Safety Advisor assigned to West Campus and can be reached at kimberly.heard@yale.edu.

