

LABORATORY & CHEMICAL SAFETY

Independent University, Bangladesh is committed to providing a safe laboratory environment for its faculty, staff, students and visitors.

The purpose of this guide is to promote safety awareness and encourage safe working practices in the laboratory. These brief guidelines should serve as a reminder of things you can do to work more safely and are applicable to all users of the laboratory.

All research workers are expected to adhere to safety guidelines and maintain safety standard expected in a university facility where direct staff observation is not possible.

Laboratory Hazards

Hazards in the laboratory fall into three general categories:

Equipment:

A wide variety of equipment is used for different activities. Most of the equipment is delicate, sensitive and expensive. Before you use any equipment you must learn about its operation and its safety implications. Misuse of equipment can lead to injury delay in project work and substantial cost in repair bill.

Gases

A variety of compressed gases are used, some of which may be toxic, corrosive, flammable, or explosive. These hazards have been minimised by the use of proper equipment, proper confinement, ventilation, safety valves, etc., and by procedural controls. You must learn about the safe handling of gases before embarking on their use. An accident with any of these could be catastrophic.

Chemicals

Acids, bases, etching solutions and solvents are commonly used in materials chemistry and device fabrication. These are "hands on" hazards which are hard to control by engineering controls only. These chemicals can cause severe burns, tissue damage, organ damage, asphyxiation, and genetic damage if used improperly. You must take chemical safety instructions before using any chemical.

UNDERGRADUATE TEACHING LABORATORY SAFETY REGULATIONS

1. NO STUDENT MAY WORK IN A LABORATORY UNLESS AN INSTRUCTOR IS ON DUTY.
2. RECOMMENDED EYE PROTECTION MUST BE WORN AT ALL TIMES IN THE LABORATORY, UNLESS SPECIFICALLY INSTRUCTED OTHERWISE.
3. NO SMOKING, EATING OR DRINKING IS PERMITTED.
4. LABORATORY COATS ARE RECOMMENDED WHILE WORKING IN THE LABORATORY.

In addition to these four basic rules, the following regulations should be observed:

1. No student may perform an unauthorized experiment.
2. Never leave an experiment in progress unattended.
3. Any chemical which produces toxic vapors must be used in a fume hood.
4. Wipe-up spilled chemicals and bottle `rings' immediately.
5. Never handle or pour flammable liquids near an open flame.
6. Report all accidents to the instructor immediately.
7. Unless given specific permission to the contrary, NEVER pipette a liquid by mouth; Use a rubber bulb.
8. Keep the sinks clean.
9. At the end of the period, make sure the hood, work area and sink are clean and tidy.
10. Always store flammable liquids in appropriate cabinets.
11. Do not store incompatible reagents together (e.g., acids with organic solvents).
12. Do not store ethers or similar chemicals for extended periods of time as explosive peroxides could form.
13. Date chemicals when received and opened.
14. Make sure that all electrical cords are in good condition and all electrical outlets are earthed.
15. Remain out of the area of a fire or incident if you are not in position to help.

Laboratory Safety Equipment

Extracted Wet Bench

Extracted wet bench capture, contain, and expel emissions generated by hazardous chemicals or chemical reactions. All laboratory experiments with chemicals should be done in extracted wet bench. While it is possible to predict the release of undesirable or hazardous effluents in most laboratory operations, surprises can always happen. Therefore, the extracted wet bench offers an extra measure of protection.

Fume hood should not be used for long-term chemical storage.

Chemical Storage Cabinets

Storage of flammable and corrosive chemicals in the lab should be limited to small quantities as far as possible. Flammable materials should be stored in flammable material storage cabinets.

Storage outside of the cabinet should be limited to materials used in the current process and must be returned after use to the appropriate storage cabinets. Leaving chemicals on benches or working areas is hazardous and is not acceptable.

Plastic cabinets are designed for corrosion resistance and used for storing acid and other corrosive materials.

Acids and other corrosive chemicals in the chemistry laboratory are stored under the fume hoods.

Refrigerators

To prevent potential safety hazards, the length of storage of chemicals should be kept to a minimum and refrigerators should be periodically inspected.

Eyewash Stations

Eyewash station which is basically a sink with continuous flow of tap water is available in the chemistry laboratory and is accessible to all laboratory personnel.

Always flush the eyewash line before use. Water should not be directly aimed onto the eyeball, but rather, aimed at the base of the nose. This increases the chance of effectively rinsing the eyes free of chemicals (harsh streams of water may drive particles further into the eyes). If wearing contact lenses remove them as soon as possible to rinse eyes of any harmful chemicals.

Fire Safety Equipment

Please familiarize yourself about the location of Fire Alarms. Fire Extinguishers are located near exit.

Suggestions

Learn the locations of the eyewash and fire extinguisher and know how to use them. While working in the laboratory, beware of burns from forgotten, still-lit burners and from hot glassware. Wash your hands at the end of each laboratory class.

If you are unsure about any directions, ask your instructor. For example, ask for his/her instructions when disposing of used chemicals. Finally, never hurry when performing experiments. Safety always has the highest priority.