

# Safety Training for a TA

## Boston College

### Merkert Chemistry Center

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A Teaching Assistant supervises the performance of pre-determined chemical procedures by undergraduates. Many of the administrative procedures for safety are in place and handled by the department's teaching lab staff. The primary safety responsibilities of the TA are:

- to know what the general safety rules governing the under-grad lab activities are,
- to monitor for under-grad compliance with the general safety rules
- to enforce under-grad compliance with the general safety rules,
- to know what particular safety and health hazards are associated with each experiment,
- to instruct the under-grads in the hazards and proper precautions for each experiment,
- to give good example to the under-grads by observing the same safety rules,
- to handle all chemicals in his/her charge with appropriate care and caution,
- to manage the proper set-up before and clean-up after each session,
- to ensure that hazardous byproducts are collected properly,
- to know what to do in case there is a safety incident or emergency,
- to report all such incidents.

### **GENERAL RULES FOR UNDERGRADS**

#### Personal Protective Equipment:

Students handling hazardous chemicals must wear aprons, safety glasses/goggles, gloves as appropriate, and proper clothing (no sandals, no jewelry or clothing that would interfere with mobility and dexterity);

#### Student Behavior:

- Students must not behave in a rowdy, reckless or careless manner;
- they must not sit on bench-tops;
- they must not bring unauthorized persons into the lab,
- they must not perform unauthorized experimentation,
- they must not misuse chemicals and equipment,
- they must not remove chemicals from the laboratory,
- they must not eat or drink in the lab,
- they must not clutter the floor and bench-tops with personal possessions,
- they must report all accidents, injuries and other incidents to the TA;

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Chemical handling:

Students must handle chemicals as instructed to avoid spillage and contact with body, clothing, and books;  
they must return all chemical products and/or unused chemical reactants to proper storage, and not put chemicals down the sink drains;  
they must use hazardous volatile chemicals in a location with adequate ventilation;  
they must label all chemical containers and products being kept beyond the end of the lab;

Equipment handling:

students must use equipment with caution;  
they must handle glass objects carefully to avoid breakage and possible injury;  
they must dispose of broken glassware into broken glassware containers;  
they must handle sharp objects carefully to avoid injury;  
they must discard sharp metal trash (razor blades, syringe needles) only into a sharps container;  
they must handle hot objects carefully to avoid injury;  
they must keep heat, flame, and electrical sparks away from flammable/combustible chemicals and materials;  
they must handle mercury-containing thermometers and other devices with great care and must report all mercury thermometer breakage/spillage;

**ENFORCEMENT OF THE RULES**

Under-grad students may need occasional reminders of the rules. However, any student who repeatedly violates the rules and makes little or no effort to reform needs to be dealt with in a firm fashion. After a student has been informed of non-compliance and warned of the ramifications of the non-compliance, the following measures can be taken in an escalating fashion:

Loss of points on the safety/attitude section of the lab performance evaluations;  
Banning from the current lab session and loss of credit for that session;  
Forced withdrawal from the lab course.

Do not hesitate to report serious non-compliance to the Director of Teaching Labs.

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**EMERGENCY SITUATIONS**

An emergency situation is typically one of the following:

- I) Fire
- II) Chemical Spill
- III) Injury
- IV) Building Alarm/Evacuation

I) In preparation for a **fire** emergency:

- know where the lab and hall fire extinguishers are,
- know where the nearest fire alarm pull is,
- know where the nearest building exit is,
- know the evacuation rally area,
- pre-instruct students how to exit in an emergency,
- know where the central gas shut-off is,
- know where the central electrical shut-off is,
- know where there is a container of sand,
- know how to use a fire extinguisher, but only if comfortable and confident with using a fire extinguisher.

In case of a minor fire in the lab (e.g. beaker fire):

- 1) Move students away from the area;
- 2) Douse the flame by smothering with a non-combustible material (fiber or sand etc.), OR  
by gently spraying with dry chemical fire suppressant from extinguisher;
- 3) If the fire cannot be controlled and extinguished, treat as a major fire.

In case of a major fire in the lab (e.g. a large section of bench-top or floor on fire):

- 1) send the students calmly out of the lab to the rally area  
IMMEDIATELY;
- 2) spray suppressant from extinguisher on fire ONLY IF YOU ARE  
COMFORTABLE WITH USING A FIRE EXTINGUISHER AND THE  
FIRE SEEMS MANAGEABLE; OTHERWISE, SKIP TO THE NEXT  
STEP;
- 3) if the fire is out of control, leave the lab, making sure all students have left,  
shutting off the gas at the main shut-off as you leave the room, and closing  
the door behind you;
- 4) pull the nearest fire alarm;
- 5) remain near the building and attempt to make contact with department  
administrators and/or BC Police to report the nature and location of the fire;
- 6) file an incident report with the Director of Teaching Labs.

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- II) In preparation for a **chemical spill**,
- know where the spill kit is,
  - know where the sodium bicarbonate is,
  - know where extra absorbent can be found,
  - know where the nearest phone is and the BC Police emergency number.

A minor chemical spill is defined as ranging from a spill of a chemical of light hazard (e.g. acid,/base/ salt solution between pH 6 and 8, most non-hygroscopic, non-subliming, and non-pyrophoric solids) and less than ~4 liters liquid or less than 1 Kg solid, to a spill of a chemical of moderate hazard (e.g. alcohol, 1 Molar hydrochloric acid) and less than ~500 ml liquid or 1 kilogram solid). The difference between major and minor spill is relative to the length of time it would take to clean the spill and the degree of exposure to the hazard present before and during the clean-up.

In case of a minor chemical spill:

- 1) move students away from spill;
- 2) notify lab technician, lab director, and/or evening faculty supervisor;
- 3) don gloves;
- 4) sprinkle with sodium bicarbonate, if acid or base solution to neutralize;
- 5) sprinkle with appropriate absorbent material to absorb spill, if liquid;
- 6) consolidate and sweep/scoop up the solid/solidified mass and place it and all clean-up equipment in a chemical waste bag;
- 7) file an incident report with Director of Teaching Labs.

In case of a larger or more hazardous spill than specified by “minor”:

- 1) send students out of the lab;
- 2) secure the lab;
- 8) notify lab technician, lab director, and/or evening faculty supervisor;
- 3) file an incident report with the Director of Teaching Labs.

- III) In preparation for an **injury**,
- know where the first aid kit is,
  - know where all safety equipment is located,
  - know where the nearest phone is and the BC Police emergency number.

A minor injury is defined as a low severity heat burn to a small area of skin, a light chemical exposure of the skin to a chemical of no more than light hazard, a small cut that can be washed and closed by bandage, a light bruise to a part of the body other than the head. Some exceptions: acute ingestion or inhalation of any chemical, any exposure to acutely toxic chemical, any chemical exposure to the eye, any chemical exposure into a skin wound, a blow to the head area; consider these major.

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In case of a minor injury:

- 1) bring the injured student to the safest section of the lab for appropriate treatment;
- 2) treat the injury appropriately, cool water for a burn or chemical exposure, soap and water and bandage for a cut, cold compress for a bruise;
- 3) notify lab technician, lab director, and/or evening faculty supervisor;
- 4) designate a fellow student or administrator to assist the student;
- 5) if student feels any lingering symptoms (breathing difficulties, light-headedness, persistent bleeding, persistent discomfort etc.), send student immediately to the Health Services in the company of a student or administrator, or, if at night, call BC Policeto for assistance;
- 6) in any case, refer student to subsequent medical follow-up;
- 7) file a report with the Director of Teaching Labs.

In case of a major injury (all non-minor injuries),

- 1) get student to safest area of lab, if possible, and counteract injury if feasible, using eye wash, safety shower, fire blanket, etc.;
- 2) call BC police emergency number and request aid;
- 3) contact administrators and/or designate student to assist you in managing the incident;
- 4) be prepared to give police all appropriate information, including MSDS information;
- 5) file a report with the Director of Teaching Labs.

- IV) In preparation for a building evacuation,  
know where the nearest building exit is,  
pre-instruct students how to exit in an emergency,  
know the rally area location.

If the building alarm sounds:

- 1) tell students to shut off all equipment;
- 2) send students calmly to rally area outside the building by closest accessible door, following behind them when the room is empty and the doors are closed;
- 3) attempt to take a head-count of your group in the rally area.

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General Reminders:

The TA must monitor student compliance, and, to give good example, do likewise.

Do not jeopardize your safety or the safety of others in responding to an emergency; err on the side of caution.

Do not absent yourself for a prolonged time from the lab where students in your charge are working; get help from administrative staff or police when you need it or designate a reliable student to carry messages while you maintain supervision of the lab.

Stay with your group as best you can during evacuations.

Take notes, if you have to, to understand what happened during an incident, and be able to convey pertinent information to others.

The clean-up of spilled body fluids (blood, urine, etc.) must be done with all due caution according to the protocols of blood-borne pathogen regulations and the clean-up must be treated as hazardous.

All chemical clean-up must be treated as hazardous waste.

Do not use the building elevators during a fire emergency or evacuation.

Remember: no chemicals down the sink drains.