

## SAFETY REGULATIONS

### 1. INTRODUCTION

The link to the Handbook of Safety Regulations of the School of Chemistry can be found at <http://sydney.edu.au/science/chemistry/local/safety.html>. This School Safety Handbook deals with regulations relevant to all personnel, from those with no laboratory contact, through to research laboratory workers and academic staff. The laboratories of the School of Chemistry can be divided into two classes, undergraduate laboratories (first to third year) and research laboratories (fourth year students, research students and post-graduate workers). The parts of the Safety Handbook that are relevant to first year students are reproduced here (in an amended form) over the next 6 pages.

The University has a statutory obligation to provide a safe working environment. Safety in the workplace is a cooperative venture, and staff and students have obligations to contribute towards and maintain safety.

Safety in the School, as in any workplace, is a matter of commonsense and good organisation. It is the responsibility of all individuals to ensure they work safely. Both State and Federal legislation cover laboratory safety, and The University of Sydney is obliged to comply with such regulations. The following procedures and guidelines have not been written from a legal point of view and are not intended to be a comprehensive compilation of safety practices and techniques, but rather as a general guide designed to assist you to meet your obligations in providing workplace safety, and in the event of an emergency. Failure to observe these procedures will lead to the School not complying with legislation, and repeated offenders will be disciplined. Failure to obey safety instructions issued by a responsible member of staff, *e.g.* demonstrator, supervisor, technical officer or safety officer, will lead to automatic expulsion from the laboratory.

### 2. GENERAL INFORMATION

#### **Responsibilities.**

All members of the School of Chemistry, including undergraduates, are required to:

- observe strictly the following safety regulations and procedures. Safety regulations are in place to protect all members of the School and will be strictly enforced by the Head of School.
- familiarise themselves with the location and operation of safety devices (fire extinguishers, fire blankets, safety showers, first aid equipment and fire exits) in the vicinity in which they work.

If in doubt about any matter likely to affect safety, the Floor Safety Officer must be consulted. S/he will be prepared to advise or act on any such matter at any time.

## Evacuations and Alarms

The building is fitted with a thermal fire detection and automatic alarm system. There are also a number of break-glass points available in case of a non-fire emergency. These white break-glass units, when activated, initiate the evacuation system, but do not close the fire-doors and do not automatically notify the Fire Brigade.

During an alarm, the Chief Warden and Wardens have control of the entire building, and you must comply with their reasonable directions. Once evacuated from the building, you may only return when the "All Clear" is given by the Chief Warden or senior fire officer present, or the security officer in charge. After-hours, when the warden system is not operating, officers from the Security Services will take charge of the building.

If the fire / emergency alarm system is activated you will be required to evacuate the building, unless the alarm is terminated. The first stage of the alarm is an interrupted beeping sound issued over the speakers and increasing in volume. This is the ALERT signal, and on its sound you should prepare for evacuation. That is:

- turn off all non-vital equipment;
- collect or lock away personal or valuable items and prepare to evacuate the building at the direction of your Floor Wardens.

The system then moves into EVACUATE mode, indicated by a change to a rising repeated tone and later a voice message. Depending on the physical location of the emergency, there may be a delay in hearing this signal. All personnel must evacuate the building immediately *via* their closest safe fire exit, or as directed by a warden. During evacuation:

- do NOT use a lift. Should you be unable to use the stairs, make yourself known to a floor or area warden who will take you to the nearest fire-protected stair well, and trained personnel from the Fire Brigade will ensure your safe exit from the building.
- proceed as directed to the Assembly Area across Eastern Avenue, in front of the New Law Building as designated on exit signs, or as directed by a Warden or Security personnel. Once you have reached the Assembly Area, remove your lab coat.

## Emergencies

In the event of an emergency:

- (a) A member of staff, Service Room personnel or the front office (Room 207, phone 9351 4504) should be notified immediately. The appropriate Safety Officer must then be notified as soon as possible.
- (b) University Security can be reached on 9351 3333. If necessary Fire, Police or Ambulance can be called by dialling 0 (for an outside line), then 000, and asking to be connected to the appropriate service. Other emergency information is available on the University website and as a quick link from the School of Chemistry home page.
- (c) First-aid treatment is available. See the Service Room staff.
- (d) Do not hesitate to use a fire extinguisher if it appears necessary. Fire blankets can be more efficient if a small fire occurs in a fume hood. *Do not take personal risks.* When a fire extinguisher has been used, however briefly, the use of that particular fire extinguisher must be reported immediately to a Floor Safety Officer so that it may be refilled.
- (e) All accidents, floods, fires, *etc.*, (even if apparently trivial) are potentially dangerous situations and must be reported immediately to the Service Room personnel or the Floor Safety Officer.
- (f) Faulty safety equipment must be reported to the Service Room personnel or Floor Safety Officer immediately.

**Discipline.**

- (a) Any person found damaging or improperly using any safety equipment, or defacing safety signs and instructions will be liable to prosecution.
- (b) Mischievous conduct, skylarking, riding of bicycles, skateboards, *etc.*, playing ball games or running in the building is not allowed.
- (c) Walking on seats, desks or benches in lecture theatres and laboratories is hazardous and is not permitted.
- (d) Fire exits, corridors, aisles and doorways must be kept clear at all times.
- (e) Stairways must not be obstructed, nor used for seating.
- (f) Do not get into a lift when there is a container for cryogenic liquids being transported in it. These Dewars for liquid nitrogen or other cryogenics must travel unaccompanied at all times.
- (g) All workplaces are to be kept clean and tidy.
- (h) Food may only be prepared and consumed in designated areas. No eating or drinking is allowed in laboratories. Laboratory beakers, *etc.* must not be used for drinking.
- (i) University regulations prohibit smoking on campus except in designated smoking areas. No such designated area exists in the immediate vicinity of the School of Chemistry.
- (j) Liquor may not be consumed in the School of Chemistry without the permission of a member of academic staff authorised by the Head of School.
- (k) Non-qualified persons must not operate or handle workshop equipment at any time.

**Incident Reports**

To comply with the requirements of legislation and to maintain an effective accident/incident monitoring system, the University is committed to the following:

- prompt investigation and reporting of all incidents/accidents that affect staff, students and visitors by the immediate supervisor or person in charge of the area;
- consultation by supervisors with those involved and prompt action to prevent recurrence;
- compilation and periodic review of accident statistics to determine accident trends and identify work areas of concern;
- provision of instruction and training for staff in accident/incident investigation.

Incident Reports are to be completed if personal injury or property damage occurs as the result of an accident. The Safety Committee examines these reports at its monthly meetings, and so would also encourage the reporting of cases of “near misses”, *i.e.* incidents that could have resulted in personal injury or property damage. It should be emphasised that the Safety Committee’s purpose is not to be judgmental, but to use these incidents constructively to improve the School’s safety practices and performance.

**3. LABORATORY RULES.****General.**

The following general rules apply.

- (a) No experiment may be commenced without first assessing the hazards of all materials involved and the risks associated with the experimental procedures.
- (b) No undergraduate student may work in a laboratory unless under the supervision of a member of academic staff authorised by the Head of School.

- (c) Laboratory coats, covered footwear and eye protection must be worn at all times in all laboratories where chemicals are being used. This is in compliance with the Australian and New Zealand Standard AS/NZS 2243:1 (Safety in Laboratories).
- Lab-coats must be worn in the laboratories, but due to the risk of contamination, are not permitted in the general access areas of the school such as corridors, toilets, offices and designated eating areas. Hooks are available at the entrances to all laboratories if you need to leave for a short time. Lab-coats should be carried in a plastic bag to prevent contamination of other personal effects. **Lab-coats must be white only, free of any “graffiti” and should be laundered regularly.**
  - Shoes must adequately cover the whole foot, have non-skid soles to provide a secure grip on the floor, and the top is to be as impervious to chemical penetration as possible (leather is best). Bare feet, open-toed shoes, open-backed shoes, sandals and thongs are not acceptable in laboratories. High heels, platform shoes and the like increase your chances of falling, so are not permitted.
  - Normal prescription spectacles may be worn instead of safety glasses provided they pass Australian safety standards. There is a chart in every laboratory that specifies the minimum permitted dimensions of lenses.
- (d) Loose hair is vulnerable to fire and contamination. If long it must be tied back.
- (e) The use of audio equipment with ear plugs is prohibited in laboratories. Because of the temptation to use mobile phones for purposes that distract from the safe performance of laboratory work (*e.g.* as a phone, texting, surfing the net, playing games, *etc.*), **the use of mobile phones is totally banned** in the laboratory.
- (f) All laboratory work is to be conducted in a clean and tidy manner. Broken glass and paper must be removed at once from all sinks.
- (g) Potential hazards associated with each experiment are clearly described in the practical notes. If in doubt about any operation consult a demonstrator.
- (h) Exercise care with all glassware. When inserting glass tubing into rubber stoppers or corks do not exert undue pressure which can lead to breakages and serious injury.
- (i) To minimise the risk of implosion, glassware which will be evacuated must be inspected for faults before applying a vacuum. This includes vacuum distillation apparatus, vacuum desiccators and rotary evaporators.
- (j) Do not pipette by mouth. Use a pipette filler.
- (k) A demonstrator must be consulted before using any electrical equipment or instrument for the first time.
- (l) Gloves should be treated as a last line of protection, not the first. Suitable gloves may be worn when handling corrosive or toxic substances. However, if you wear gloves while handling these materials, you must never come in contact with any item that a person not wearing gloves could. For instance, DO NOT touch laboratory equipment or even lab benches with your gloves on. While you are clearly unaffected by this action, any contaminants on your gloves will be transferred to the hand of the next person that touches these with an ungloved hand. Likewise, remove your gloves if you are using a computer keyboard or a pen that might also be used later by yourself or another person not wearing gloves. Also, do not touch your face, hair, mobile phone, *etc.* while wearing protective gloves. Used gloves should be disposed of as contaminated waste, *i.e.* in broken glass bins for incineration.
- (m) Faulty equipment of any kind must not be used. All equipment should be checked before use. Broken glassware should never be used.

- (n) Repairs to faulty equipment, particularly electrical equipment, should not be attempted except by suitably trained and qualified personnel. Faulty equipment may be returned to the Service Room for repair.

**Accidents.**

- (a) Spilt chemicals must be cleaned up immediately. A mop, dustpan and broom are available from the Service Room.
- (b) In the event of an accident, get first aid attention at the Service Room immediately. The academic in charge should be informed of the circumstances as soon as possible and an accident report form completed.
- (c) Minor burns, where the skin is unbroken, should be treated immediately under cold running water for at least 10 minutes.
- (d) Do not allow any chemical to come into contact with the skin, and take care to avoid the inhalation of any vapours. Toxic effects may be cumulative. If a chemical is spilt onto the skin it should immediately be washed off with an excess of water, or soap and water, and the academic in charge informed. Students should study the safety notices outside the Service Rooms.
- (e) For large acid spills on benches and floors, apply liberal amounts of solid sodium hydrogencarbonate (or sodium carbonate and sand). Do not use water as this only spreads the acid further. Similarly, for large alkali spills use solid boric acid.
- (f) In the event of a large organic solvent spill, immediately evacuate the area and inform the Service Room staff or Floor Safety Officer. **No attempt should be made to clean it up without appropriate protective apparatus.**
- (g) Any spillage of mercury must be reported to a demonstrator or the Service Room immediately. Every effort must be made to recover every trace of the mercury since mercury is a highly toxic cumulative poison. Do not dispose of mercury, or residues containing mercury, down a sink.

**Chemical Storage and Use.**

- (a) All reagents and products must be clearly labelled to show the contents, owner and date. Unless clearly labelled, samples placed in refrigerators will be removed for disposal.
- (b) Operations involving noxious fumes must be carried out in a fume hood with the fan switched on.
- (c) Do not evaporate large volumes of solvent (except water) into the atmosphere, even in a fume hood. Use a distillation apparatus and dispose of the solvent in the appropriate organic solvent container.
- (d) Boiling chips are to be added to every liquid that is to be boiled, except aqueous solutions for quantitative analysis. These promote steady boiling of the liquid, and eliminate the danger of superheating. If for any reason boiling is interrupted, fresh chips must be added before heating is resumed. Never add boiling chips to a hot liquid - allow it to cool first.
- (e) Bunsen burners should only be used after consultation with a demonstrator. Steam baths or electric hot plates should be preferred wherever practical. Never carry out an extraction using organic solvent near a lighted Bunsen.

**Waste Disposal.**

- (a) Disposal of all waste materials must be carried out in an appropriate manner.
- (b) Organic solvents must be placed in the appropriate waste solvent container.
- (c) Strongly acidic or alkaline solutions should be washed down the sink with large volumes of water.
- (d) Silver, mercury, chromium and other toxic metal wastes must be placed in the appropriate waste containers.
- (e) Alumina and silica gel used in adsorption chromatography must be dried before being emptied into the waste bin designated for this purpose.

**Responsibilities.**

The following practices should be routinely observed.

- (a) Acquaint yourself with the potential *hazards* of experimental chemistry by reading the safety information given with each experiment.
- (b) Acquaint yourself with the correct method of disposal for all waste generated. This is clearly explained in the safety information given with each experiment. In general:
  - filter paper and other solid material should be disposed of in the rubbish box beneath your sink;
  - broken glass and Pasteur pipettes should be placed in the sharps container at the front of the laboratory;
  - organic solvents must be placed in the appropriate waste solvent container;
  - heavy metal wastes must be placed in the appropriate waste containers in the fume hood.
- (c) Keep your work-place and the side bench and fume cupboard *clean and dry*.
- (d) Protect your work-place by using your *fibro mat* under your gas burner.
- (e) Replace *bottle-lids and stoppers* immediately after use.
- (f) Replace empty solutions, broken glassware, *etc.* from the Service Room.
- (g) At the end of the session carry out the *close-down procedure*.
  - Make sure that any special apparatus is clean and on the bench.
  - Wipe down your work-place.
  - Place your stool under the bench, allowing free movement through the lab.
  - Check that your gas taps and water taps are turned off.
  - Remove solid material from the sink.

The following practices are prohibited.

- (a) Placing any broken glass, filter paper or other solid material in the sink.
- (b) Performing any experiment involving substances of a known explosive or dangerous nature. Such experiments are strictly forbidden.

**4. INFORMATION SPECIFIC TO THE BODEN LABORATORIES**

The Safety Officer for Level 2 is Marjan Ashna (Service Room).

The First Aid Officer for Level 2 is Marjan Ashna (Service Room).

All injuries including cuts, burns, adverse reactions to chemicals, *etc.*, must be reported to the Service Room for treatment.

If required to evacuate the laboratory, wait until told which exit(s) to use. If safe, the preferred route of egress is *via* the front of the lab, down the main corridor and out the front of the building and across Eastern Avenue. If instructed to evacuate via the rear of the laboratory, proceed down the stairs and out the fire exit. Make your way around the building to the front of the new Law Building.