Sheffield Hallam University

Faculty of Health and Wellbeing

Biosciences and Chemistry Department

General Safety Guidelines

Contents

Bioscience and Chemistry Safety Contacts

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University's Health and Safety policy

The University's Health and Safety policy is available for staff at https://portal.shu.ac.uk/departments/HRD/SiteCollectionDocuments/Health%20and%20Safety%20New/H%20and%20S%20management%20and%20Governance/HSSPG01%20Health%20and%20Safety%20Policy.pdf

Safety information published by the University and HWB (including full details of the Faculty's H&S arrangements) is accessible via the Faculty's H&S SharePoint site (staff only) or by contacting David Boden.

Definitions

The term **'student'** used in this manual will apply to any student *e.g.* on a taught course of study, studying for a PhD or carrying out work experience.

The term **'Faculty'** in this document refers solely to the Faculty of Health and Wellbeing.

The term **'University'** in this document refers solely to 'Sheffield Hallam University'.

The term **'hazard'** is used to denote something which could cause harm to an individual.

The term **'risk'** is used to indicate the likelihood and magnitude of harm which will occur, if an individual is exposed to a hazard.

The term **'near-miss'** is used to indicate any incident which merits investigation and which had the potential to cause harm.

General Safety Guidelines for Staff and Students

This is an introduction to good working practice in the Department of Biosciences & Chemistry and the BMRC (Biomolecular Sciences Research Centre). Future guidance will be given in the form of verbal instruction at the time of carrying out work, formal training or further documentation.

Guidelines on laboratory safety and chemical use are formulated on the basis of past occurrences in laboratories, basic chemical knowledge, the properties of individual chemicals and in some cases in response to specific incidents of laboratory and chemical misuse.

The primary responsibility for safety rests with the individual. All workers should be responsible and considerate with an understanding of the working of the laboratory, its equipment and basic chemical safety. Any inconsiderate user can endanger his or her own as well as other's safety.

A large proportion of incidents and problems in the laboratory are the result of haste. Plan enough time for your work to ensure you do not waste your samples, time, get unreliable results, break things and endanger yourself and others by being careless. If you do not have time to do things correctly and safely, with adequate time for thought, please do not proceed.

Your safety in the laboratory is determined not only by your own actions but also by the actions of those around you. Lab users are in the best position to observe the behaviour of others. If you see inappropriate or unsafe behaviour you should report it to your lab demonstrator or supervisor at the first available opportunity.

Legal responsibilities

The Health and Safety at Work Act *etc.* (1974) (HSAWA) and subsequent legislation places responsibility for the management of safe working conditions and practices within the workplace with the employer.

However, the HSAWA requires that every person engaged in work within an establishment shall act to ensure the safety of himself/herself, other workers and the general public who may be affected by his acts or omissions, and to co-operate in ensuring that all the provisions of the Act can be implemented as fully as possible.

It is a statutory requirement that every staff, student or visitor, adheres to the guidelines and instructions contained in this manual and any other associated documents, and that they should have an awareness of what is reasonable and safe practice.

N.B. Students are classed as employees for the purposes of the HSAWA.

Carrying out bad practice or not following the guidelines can result in accidents and injuries. In this situation disciplinary action from the University may be taken against the student (Undergraduate or Postgraduate) which could affect course progression. The use of laboratories depends on maintaining a safe working environment. Thoughtless behaviour or violations of the guidelines will not be tolerated.

Risk Assessment

The Management of Health and Safety at Work Regulations (1999) requires that all work carried out within the Biosciences and Chemistry Department, and BMRC, must be risk assessed *before* work commences.

Any variation or alteration to work processes should be examined and the risk re-assessed *before* the process is resumed.

Risk assessments will include chemicals covered by COSHH (the Control of Substances Hazard to Health Regulations (2002) issued by the Health & Safety Executive). COSHH covers all chemical handling and use in a workplace. These guidelines are mandatory and they apply to all chemical handlers and users.

The absence of any information regarding a procedure must not lead to the assumption that a process/procedure or any other work is '*safe*'.

It is the responsibility of the individual person (staff, student, visitor) to ensure that they are aware of any hazards associated with the procedure, and have adopted any control measures necessary to minimise any risk involved.

Filling in a risk assessment form should not be for the fulfilment of legal obligation only; this is an opportunity to learn about the experimental process, hazards associated with chemicals, safety implications and how to handle and use the chemicals and equipment safely.

All teaching is risk assessed; students MUST arrive at practical classes on time. The demonstrator will deliver the Health and Safety information specific to the experiment at the start of the class. If you miss this you may not be allowed to continue.

Staff and students with disabilities or health related concerns

Whilst at no time would any member of staff, student or visitor be knowingly put at risk from any activity being undertaken individuals with certain disabilities or specific health related problems may feel compromised when faced with complex techniques requiring a degree of manual dexterity or when using certain chemicals and reagents likely to aggravate their condition.

In order to minimise/remove any unnecessary worries and risks, persons within this category are encouraged to discuss their individual problems, in full confidence, with any relevant course tutor, line manager, Student Support Officer or member of staff of the University Safety Service, or Technical Team Leaders (Kay Simmonite or Karen Bailey-Smith).

Pregnancy and Laboratories

Pregnancy is not a reason to stop working in the laboratory providing the work to be carried out is risk assessed and the appropriate control measures are in place. It is important to consider all aspects of the process but also, some chemicals may be more hazardous to pregnant women, the unborn child or may affect fertility.

You should inform your course tutor, line manager, Student Support Officer or Technical Team Leaders (Kay Simmonite or Karen Bailey-Smith) if you are pregnant.

Fire Safety

The University is zoned into areas of fire safety, linked by a computerised fire and smoke alarm system. Two types of warning tone are sounded in an emergency:

If you hear a **CONTINUOUS TONE evacuate the area immediately.** Follow the directions on the blue fire notices posted adjacent to the fire alarm call points throughout the University. Fire marshals will be present to direct you out of the building to a muster point. **If you are told to leave the building by a fire marshal, then you must do so.**

If you hear an **INTERMITTENT TONE,** this indicates that an **adjacent** area is to be evacuated, but you are currently in no danger and may carry on working. However, **you must be alert and ready to evacuate if the tone changes to continuous**.

Ensure that you are familiar with the alternative means of escape by walking the routes from the area in which you are working and familiarise yourself with the assembly points indicated on the blue fire signs.

If you have to evacuate the premises:

- **DO** exit quickly and calmly
- **DO** go directly to open air

- **DO NOT** enter an adjacent building
- **DO NOT** stop to collect belongings

- **DO** close the door behind you but **DO NOT** lock it.
- **DO** obey instructions from Fire Marshals**.**

Fire Action Procedure

On suspecting or discovering a fire:

- **Raise the alarm** by breaking the glass of the nearest fire alarm call point.

- **Inform Security Control** by dialling **888** or **2000** on an internal phone and give the relevant information. Security Control will call the Emergency services.

- Should there be any problem or delay in contacting Security Control, call the Fire Brigade direct from an internal phone by dialling **9 999** and give the correct address of the building and any other information they require.

- **Leave the building** by the nearest available exit route as directed by the green Fire exit signs or Fire Marshals.

- DO NOT USE LIFTS

- Go directly to your assembly point

Please ensure that you familiarise yourself with the exit routes for the areas in which you will be working.

In the event of fire, take the nearest Fire Exit in the direction **away** from the fire.

First Aid

The Biosciences and Chemistry Department has a number of first-aid personnel who are trained to cope with minor accidents.

Green first aid signs found around university buildings detail who first aid personnel are and their location. Make sure you know where you can find your nearest first aider.

If a student or visitor requires assistance, they should contact *any* member of staff - academic, technical or administrative, who will be able to contact a First-aider for them.

If a Faculty First-aider cannot be summoned then dial Security Control, 888 or 2000 from an internal phone and assistance will be sent. All Security staff are trained First-Aiders.

Any accident, no matter how minor, **must** be reported. Staff should report accidents and near misses using the online system: **https://shu.awaken-be.com/** Students should come to the Biosciences and Chemistry Technical Prep Room, 840, Owen. 'Near-miss' occurrences should also be recorded, even though no injury has occurred.

Reporting accidents and near misses allows investigation into possible patterns or identification of things which may be dangerous but have not yet caused an injury. The information can then be used to prevent further incidents.

First Aid Boxes

First aid boxes are sited in some of the Biosciences and Chemistry labs and in the BMRC. They provide materials for First-aiders to deal with minor injuries. They should only be used by approved first-aiders.

Please help us to maintain the boxes in a ready state.

Please inform the First-aider indicated on the front of the box if you use any of the materials, or if you find that any of the stocks are depleted or missing.

Good Laboratory Practice

Good laboratory practice should be observed in laboratories at all times as a minimum standard:

Lab coats and PPE (personal protective Equipment)

- Wear a properly fastened lab coat at all times.

- In some areas it is mandatory to wear other items of safety equipment, such as **safety spectacles, gloves** *etc.* Your risk assessment or lab demonstrator will inform you of this.

- All safety wear, including laboratory coats, should be removed prior to leaving the laboratory. Laboratory coats **must not** be worn in any public areas where food and drink are sold/consumed, or toilets.

- Disposable gloves should be removed before leaving the immediate work area and **MUST NOT** be worn outside the laboratory even if they are considered clean. If it is necessary to wear gloves for carrying an item between labs you must either seek help or have one ungloved hand for opening doors etc.

  Gloves are worn to protect the user from contamination, or to protect material from contamination by the user. In both cases it is inappropriate to wear gloves outside laboratories, since there is a danger of spreading contamination to others (via door handles etc.).

Gloves must always be disposed of in the yellow incineration bins, not the general waste bins (even if they are clean).

- If you are using a mobile phone or tablet for your lab work you must remember to use it in a clean area e.g. place it on your lab note book or a clean section of bench away from your experimental work; also you should not wear gloves when using your device.

- Keep your presonal belongings in the correct storage areas - not on the lab benches or on the floor.

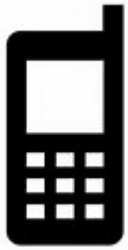
Hygiene

- Always wash your hands before leaving the laboratory and before eating or going to the toilet. This task should be carried out **after** your lab coat has been removed.

- No eating or drinking in any laboratory at any time. Food or drink should not be brought into the laboratory.

- During laboratory work contamination on the hands may not be noticed immediately. Never touch any part of the body (the area around the eyes is especially vulnerable) without washing your hands first. Always wash off any chemical contamination immediately. If you do contaminate anything (e.g. the bench top or water tap) clean up the contamination immediately.

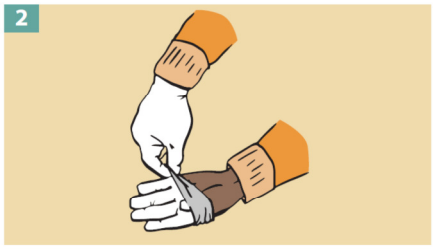
  This is also applicable to mobile phones which you will use next to your face.



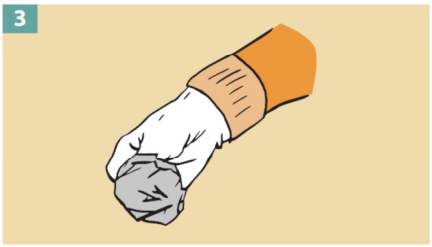
How to Remove gloves safely

To protect yourself, use the following steps to take off gloves. If you are in the lab all day you should change your gloves regularly and dispose of them in the yellow incineration bin or the waste bag on the lab bench. Remember do not wear gloves when using opening or closing doors or using your mobile phone/tablet.

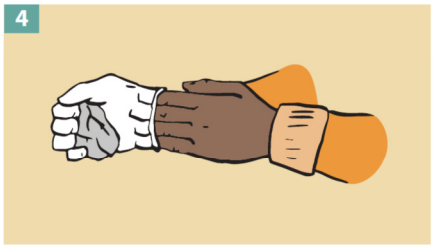
With both hands gloved, grasp the outside of one glove at the top of your wrist, being careful not to touch your bare skin.



Peel off this first glove, peeling away from your body and from wrist to fingertips, turning the glove inside out.



Hold the glove you just removed in your gloved hand.



With your ungloved hand, peel off the second glove by inserting your fingers inside the glove at the top of your wrist.

Turn the second glove inside out while tilting it away from your body, leaving the first glove inside the second.

Dispose of the gloves safely. Do not reuse the gloves.

Clean your hands immediately after removing gloves and before touching any objects or surfaces.

Image taken from https://www.cdc.gov/vhf/ebola/pdf/poster-how-to-remove-gloves.pdf

Laboratory accommodation

- Keep the laboratory and your bench area clean, tidy and safe for yourself, your colleagues and others (e.g. technical staff, academic staff, cleaners and maintenance personnel).

- Storage areas for your personal belongings are provided for you to use. You must not put your bags and coats on the floor of the lab or on the benches/work surfaces in the lab. Storage options are:
    - Knee space under your lab bench for teaching labs 841/835/834/821 Owen.
    - Lockers on the corridor for 806/803/802 Norfolk.
    - Storage cubes and coat hooks near the entrance to the lab for 826 Owen and the STEM lab in Eric Mensforth building.

- All corridors and emergency exit routes must be kept clear of obstructions. Do not store materials, boxes, bottles *etc.* on the floor near these routes.

- There are safety showers in room 803 Norfolk and the STEM lab in Eric Mensforth Buildings. These are for emergency use only.

- In addition to the fire alarms there are gas alarms in some labs. If an alarm sounds evacuate the lab. If you are outside the lab, do not enter if the alarm is sounding. Inform the lab demonstrator or a member of technical staff.

Personal requirements and conduct

- Long hair must be tied back and any loose items of clothing, jewellery *etc*. not adequately contained by the laboratory coat must be secured or removed.

- Open-toed shoes or sandals and high-heeled footwear should not be worn in the laboratory. Shoes should be enclosed to provide some protection to feet against spills. Footwear must also give a secure grip on the floor; hence high heels are not suitable.

- All cuts or abrasions to the hands should be covered prior to work being started.

- The use of headphones is prohibited when working in the laboratories. Users must be fully aware of their surroundings and the events taking place around them.

- **Coats and bags** *etc.* should be stored neatly in the knee spaces, storage compartments or the lockers provided. Note that space in these facilities is limited. Personal items should not be placed on the floor or on the benches/work surfaces in the lab.

- Behavior in the laboratory must be professional at all times. You must never attend the lab if you are under the influence of drugs or alcohol.

If in any doubt at all consult your lab demonstrator or member of technical staff before proceeding.

Access to laboratories

- Teaching laboratories are accessible to students when:
  - There is a scheduled laboratory session. Practical classes have fixed start and finish times which will be adhered to.
  - They have permission from appropriate members of Technical and Academic staff and are supervised appropriately.

- Undergraduate students do not have access to stores and plant rooms.

- Areas designated 'Restricted Access' can only be entered with the consent of technical staff.

- Undergraduate students do not have access to Research laboratories unless under the supervision of research staff / academic supervisors.

- All members of staff/research students in the BMRC who wish to remain at work after normal hours are recommended to read the BMRC Blackboard site which details ‘Lone working / Out of Hours Working’ arrangements.

Laboratory Support and Supervision

Laboratory classes will be supervised at all times by a laboratory demonstrator.

In addition, technical staff may demonstrate specific instruments or techniques to small groups of students.

Technical support can be found in the prep room; room 840 Owen.

General Laboratory Operations

Laboratory cleanliness and Housekeeping

All workers should ensure they work under clean conditions and leave their work area in a condition such that other members of staff and students are not exposed to any risk.

Benches, work surfaces, balances and all equipment should be kept clear of unwanted materials and solutions.

Reagent bottles and chemicals should be returned to their appropriate location as soon as they are finished with.

Waste should be disposed of using the appropriate waste stream.

At the end of a scheduled practical class students must ensure that the equipment they have used and the areas in which they have worked are clean, tidy and safe.

Research staff and students have a responsibility to maintain a safe and tidy working environment within the BMRC.

Spillages

When dealing with spillages you must consider:

- the nature of the spilt material,
- the extent of the spill on floors and other contaminated surfaces,
- any bottles and equipment that may be affected,
- use of the spill kits.

Act on a spill immediately,
Remember - wet floors can be dangerous.

During teaching, all spillages must be reported to the lab demonstrator or technical staff.

Major spillages, and any spillages of carcinogenic chemicals, micro-organisms or other potentially harmful materials must be cleaned up using the appropriate technique and reported to the lab demonstrator or member of technical staff.

In the event that the spillage requires more specialist treatment, the area may need to be evacuated.

Glassware

Broken glass causes a large number of cuts in the Faculty of Health and Wellbeing every year.

Please take care when handling glass.

Examine all glassware prior to use. Chipped, cracked or otherwise flawed glassware should not be used; any such items should be returned to the Technical Staff.

Take special care when inserting glass graduated pipettes into the blue, green and red pipette fillers. You will be shown the correct procedure for this during your laboratory sessions (there is also guidance on the next page of this booklet).

Glassware broken during the course of experimental work must be placed into the special **'Glass Disposal'** boxes, provided in every laboratory. **Glass must <u>not</u> be placed into the normal 'Waste' bins.**

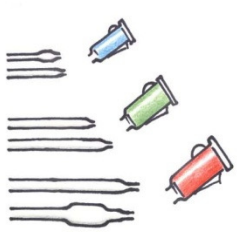
N.B. If broken glassware is contaminated with micro-organisms or toxic substances it may be necessary to decontaminate the glass before disposal. Consult the lab demonstrator or technical staff if in doubt.

Take care when using bottles for waste or heating. Bottles have been known to shatter due to a build-up of pressure from heat or chemical incompatibility. If you are unsure of what to do ask the lab demonstrator or technical staff before proceeding.

Particular care is required when setting up glass apparatus. Consult the lab demonstrator or technical staff before doing this to ensure you use the correct method and precautions.

Pipette Safety

Select the correct filler for the pipette.



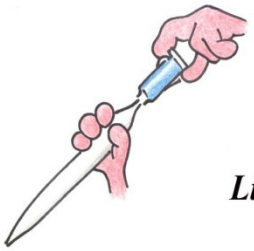
Control of the filler should be by the wheel and valve

Don't try to use a 2ml filler on a 25 ml pipette

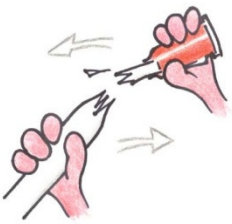
The use of excessive force....

*Broken or damaged pipettes **must** be discarded and not used.*

Gently insert the pipette into the filler



Like this



... can result in serious injury

NOT like this

Heat sources

The use of heat sources in laboratory situations can be dangerous and it is important that the correct methods are used.

Heating substances in a sealed system or vessel can create a build-up of pressure and an explosion. The vessel being heated must always have a pressure release or vent. Ensure you check your method with the lab demonstrator or technical staff before proceeding.

Never leave anything unattended while it is being heated.

Heat sources in the laboratories are autoclave, steamer, Bunsen burners, hotplate stirrers, heating mantles etc. Some basic guidelines are below but you should refer to the appropriate lab protocols and the lab demonstrator or supervisor before proceeding.

Bunsen burners

- Do NOT wear gloves when using a naked flame.
- Make sure there are no leaks/cracks in rubber hoses connecting the gas to the Bunsen.
- Keep rubber hoses away from the flame.
- Use long handled lighters, bring the flame to the side of the top opening of the Bunsen while slowly turning on the gas.
- Turn off the gas if the gas “flashes back” or burns at the burner base.

- Do not lean toward or reach across a flame.
- Never leave anything unattended while it is being heated.
- Remember that the gas burner barrel remains hot long after use.
- Turn off gas valves before leaving work area.

Hot Plates

- Use a hot plate with a smooth, clean surface.
- Hot plates appear exactly the same whether hot or at room temperature. Always assume they are hot and act accordingly.
- Keep the electrical cord of a hot plate away from water and the heating surface.
- Check the cord of the hot plate for frays and faults. Any hot plate with faulty wiring should not be used. Consult technical staff.
- **Ensure the lid of the bottle is loose.**

Steamer / Autoclave

- Ensure the lids of bottles are loose. **Do not tighten lids**. The build-up of pressure inside the bottle can cause it to explode.
- Handle hot items from the steamer and autoclave with care, using the heat gloves provided.
- Always open the steamer away from yourself to prevent steam burns.

Cold sources

Incorrect use of liquid nitrogen and minus 80 ℃ freezers can cause cold burns. The skin may freeze instantly to cold surfaces and attempts to remove the skin can cause serious damage.

Ensure you wear the cryo-gloves provided when handling.

You should also receive training before using liquid nitrogen. In addition, liquid nitrogen can cause asphyxiation in enclosed spaces so it is important you know how to handle it correctly.

Equipment

Before you use any equipment it is important to know how to use it correctly and safely. It is your responsibility to ensure you know what to do ***before*** using the equipment. If you are unsure or have not been trained you must not use the equipment - speak to the lab demonstrator, your supervisor or the technical staff first.

Always ask for help if you are unsure.

Standard operating procedures (SOPs), methods and protocols, and training can be given to help you work safely.

Use equipment only for its designated purpose.

Electrical equipment

Electrical equipment is checked regularly and should carry an in-date sticker to show this. However, faults can occur between checks.

- Check for damage (loose wires, exposed terminals, cracked casing).
- Check for water or solvent spillage before use.
- Do not use equipment with an out of date sticker or fault.
- Report faults to the lab demonstrator or technical staff.

Sharps - scalpels, needles, microtome, cryostat

Ensure sharps such as scalpels are used safely and are disposed of safely in the designated sharps bins.

The microtome and cryostat require special training which must be completed before you use them. Speak to the technical staff or your supervisor for details.

Centrifuges

Centrifuges are very sophisticated and expensive pieces of equipment, each with its own particular operational requirements. If you are unfamiliar with a centrifuge you should consult the Lab demonstrator or technical staff ***before*** you use it. Some centrifuges (e.g. the ultracentrifuge) require special training. There are however certain rules that must be observed for all centrifuges:

- The accessories used must only be those recommended by the manufacturer, for the specific centrifuge.
- The loaded rotor must be carefully balanced.
- Centrifuge tubes can be made of a range of plastics; ensure you select the correct plastic ware for your experiment. The tubes could degrade if they are unsuitable.
- The centrifuge must be kept clean. It is vitally important not to use corrosive or abrasive materials in cleaning the rotor (e.g. do not use scourers or alkaline detergents to clean aluminium rotors).
- Details of use must be entered in the diary provided.
- Stay with the centrifuge until it reaches maximum speed.

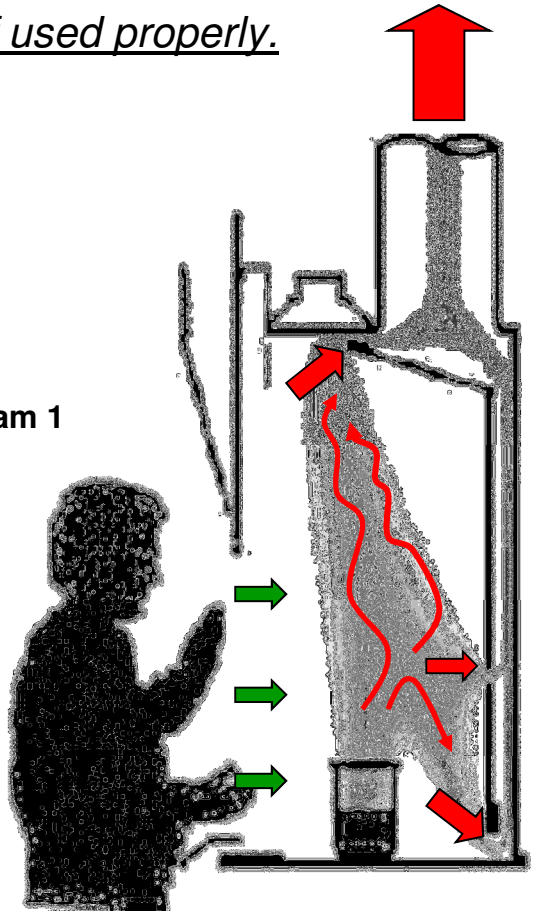
Any damage to the rotor must be reported to the technical staff immediately. Damaged rotors are dangerous and could cause an imbalance.

Safe Use of Fume hoods

A fume hood is a partial containment device used to contain some hazardous airborne substances (*e.g.* chemical vapours, gases, fumes and some dusts).

It is only effective if used properly.

Diagram 1



How does it work: (diagram 1)

- Air is drawn in through the sash opening.
- Contaminants are drawn away from the opening out through the back and top of the hood.
- Anything that obstructs the flow of air my stop the hood working properly.

- If the fume hood alarms it means it is not working properly and will not protect you. You should stop working and close the sash. Seek help from the lab demonstrator or a member of technical staff.
- All fume hoods contain a firetrace system which is activated if there is a fire - ensure you close the fume hood sash if you move away from the hood, even briefly, in order for the system to work effectively.

Good practice when using a Fume Hood:

- Check the fume hood is working before you start using it.
- Keep the sash as low as possible at all times while you are using the hood.
- When you move away (even if briefly) from the hood close the sash.
- The working space should only contain equipment and materials for the immediate work you are carrying out.
- The fume hood is **not for storage**. When you have finished using it clear your materials and equipment. Wipe up any spillages and leave it tidy for the next person to use. Pull the sash down when you have finished.
- Avoid obstructing the airflow; Do not place objects close to the edges of the inside of the hood (diagram 2).

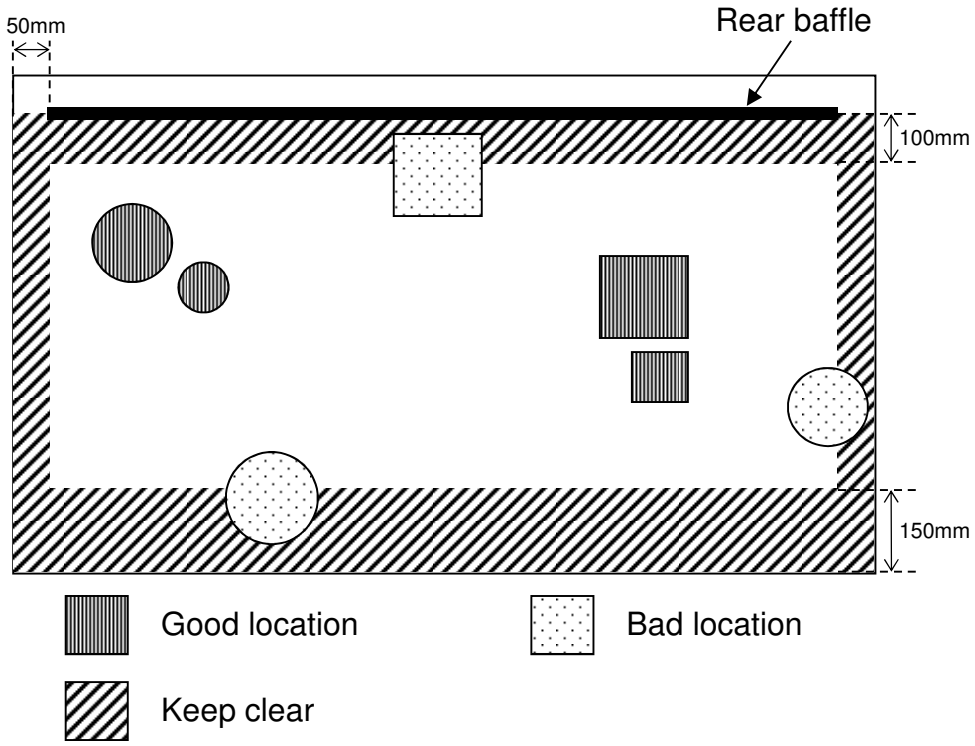

50mm
Rear baffle
100mm
150mm
Good location
Bad location
Keep clear

Diagram 2

Working with Hazardous Materials

Many of the materials in the Biosciences and Chemistry Department and BMRC have associated hazards, and it is important to be aware of what they are.

All chemicals have a Material Safety Data Sheet (MSDS), which should be used to assist in the development of a risk assessment for the process.

All workers should be aware of the hazards associated with the materials they intend to use **before** actual use begins, so that the risk of exposure to the hazard can be minimised. A risk assessment must be in place.

Certain materials require special storage either to maintain their viability or to comply with legal requirements or to ensure that there are adequate safeguards to protect workers from accidental exposure to hazards.

For taught practicals, risk assessments will be available in the lab in addition to the Health and Safety information found in the lab scripts.

Safe use of chemicals and reagents

Stock materials purchased from manufacturers should be kept in their original packaging. If the material is dispensed into other containers from stock, then the secondary containers must be labelled correctly.

Diluted solutions may not have the same level of hazard associated with them as the original concentrated solutions, but it must not be assumed that they are free from hazard.

It is the responsibility of the individual to:

- Use the chemicals safely.
- Clearly label all bottles and containers with name, substance, current date, disposal date and hazard(s).
- Keep lids on tightly.
- Store chemicals appropriately and safely.
- All Winchesters containing chemicals (e.g. acids, solvents etc.) must be transported in a Winchester carrier.
- Acids should always be added to water, (never the reverse) when mixing, to avoid violent reactions.
- All waste must be disposed of according to the risk assessment.
- Clean up all spillages immediately.
- Clean balances and communal areas where you have been working or using chemicals.
- No pipetting by mouth (use a pipettor or a hand dispenser).

Waste Streams for chemicals, reagents and consumables

There are a number of different waste streams that are used in the laboratories and it is important that they are used correctly.

There are a number of reasons for segregating waste chemicals and consumables i.e.

- COSHH regulations 2002 and the Environmental Protection Act 1990.
- To ensure students and biosciences staff, including academic staff, technical staff, cleaners and maintenance personnel aren't injured.
- To control exposure externally i.e. so we do not put the general public at risk and to ensure toxic chemicals aren't released to water courses, damaging the environment.
- To ensure that incompatible chemicals are not mixed. Mixing incompatible chemicals can have disastrous results for example creation of toxic gases or causing an explosion. e.g. **nitric acid is dangerous due to its oxidising properties, it should <u>never</u> be disposed of in a solvent bottle**
- To ensure that chemicals are incinerated when necessary and not disposed of as household waste.
- To inactivate biohazardous waste e.g. bacteria using bleach or by autoclaving and to ensure genetically modified organisms are not released into the environment.

For teaching purposes some information will be given in lab scripts but you must also take instruction from the lab demonstrator, your supervisor or technical staff.

The following waste streams are used in Biosciences and Chemistry and in the BMRC:

	**Halogenated solvent waste bottle** e.g. chlorinated solvents that should not be mixed with flammable solvents. Bottle has a **Green** label.
	**Flammable solvent waste bottle** e.g. methanol, ethanol. Bottle has an **Orange** label.
	**Incineration bin** e.g. solids such as used lab plastic ware, weighing boats, gloves.
	**Sharps bin** e.g. needles, scalpels.

	**Glass bin** e.g. broken beaker
	**Sink** Solutions not hazardous to the environment e.g. some buffers. Sink could be on the bench or in the fume hood.
	**General waste bin** e.g. tissues from hand washing. <u>No</u> gloves or chemicals.
	**Bleach pot** e.g. cell culture waste

	**Specialist waste** e.g. chemicals that are unsuitable for other waste streams such as high concentrations of copper sulphate solution which is hazardous to the environment so cannot go down the sink.
	**Waste bag and stand** Located on the lab bench. Used for solids such as used lab plastic ware, weighing boats, gloves. The plastic bag can be placed in the incineration bin when it is full.
	**Autoclave** e.g. microbiological waste

In some teaching classes there may be specifically segregated waste due to the nature of the hazards it carries. This will be indicated to you in the session, for example there may be pots labelled for used microscope slides or Winchester bottles in fume hoods labelled for a specific solution.

Experimental work

Ensure that you are fully briefed before you carry out experimental work. If you do not understand an instruction, are unsure how to operate a piece of equipment, or are unsure about the potential risks of an experiment then seek help from a competent person before proceeding further.

It is important that communal work areas and facilities are kept clean and tidy; the next person could be injured by the debris or chemicals that you have left behind.

Take care when entering and leaving a laboratory to avoid bumping into other workers. Never run! Chemicals must be transported in purpose-made carriers; a suitable trolley should be used for transporting other bulky or heavy items.

Do not leave experiments unattended unless they are stable and are not being heated. Ensure you are following the correct procedures for unattended experiments.

When you are doing experimental work you must also consider other people in the lab and the work of others for example is your experiment compatible with the one on the adjacent bench? Are you doing something that carries hazards specific to people with allergies or who may be pregnant?

If you have any concerns about your own experimental work or about the practice of others you should raise it with the lab demonstrator, your supervisor or a member of technical staff. Improvements can be made if you let us know.

Before you start work in the laboratories....

- Wear the correct PPE.
- Familiarise yourself with the risk assessment and the process to be carried out.
- Familiarise yourself with all aspects of safety before using any equipment.
- Familiarise yourself with the chemicals to be used and their hazards.
- Ensure the appropriate control measures are in place before proceeding.
- Be alert to unsafe conditions of the equipment, procedures and actions, and call attention to them so that corrections can be made as soon as possible.
- Label all reagents appropriately and store under the correct conditions.
- Avoid distracting other workers.
- Ensure you know how to raise the alarm and how to evacuate in the event of a fire.
- Ensure you know how to contact a first aider in an emergency.

Questions

If you have any questions relating to laboratory safety or any of the issues covered in this booklet please ask.

You can ask your laboratory demonstrator, members of the technical team, your tutor, supervisor or the module leader.

If you have a query please ask ***before*** you carry out the action/procedure.

SHEFFIELD HALLAM UNIVERSITY
FACULTY OF HEALTH AND WELLBEING - BIOSCIENCES & CHEMISTRY

Statement of consent

- I confirm that I have read and understood the information contained in this booklet *'General Safety Guidelines'*.

- I understand that I will be required to dress appropriately to work in a laboratory.

- I understand that it is my responsibility to inform the department of any disability/health problem that may affect my performance/safety in laboratory classes or the safety of others. The university / department cannot be liable where information has been inaccurate, incomplete or not declared.

- I understand that it is my responsibility to inform the module leader or the staff member who is taking the laboratory class if I feel unable to undertake any practical skills required during a class.

- If there anything that might prevent you from successfully completing laboratory classes and working safely in a lab environment please provide full details below.

Alternatively, you should discuss this with your tutor, module leader or the technical team leader.

I have read and understood the above points and declare that I am willing and able to participate in laboratory work in the Biosciences and Chemistry department, Faculty of Health and Wellbeing.

NAME: (**Please print**) _____

SIGNATURE: _____

COURSE: _____

DATE: _____

This completed slip MUST be returned to the <u>Biosciences and Chemistry Help Desk, Level 7 Owen building</u>, before any practical work is undertaken in the laboratories. It will be collected by one of the Technical Team Leaders (Dr K.Simmonite or Dr K.Bailey-Smith).

In accordance with the Data Protection Act this confidential form will be stored securely.