



Safe Method of Use 19

General Exempt Laboratory Requirements

Those using the General Safe Method of Use must have also read and comply with:

1. Safe Method of Use for Basic Laboratory Safety
 2. Safe Method of Use for Personal Protective Equipment
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Note that the word 'must' connotes a mandatory requirement and that the word 'should' connotes a recommendation

A. Requirements for Use and Storage of Chemicals

1. MSDS sheets must be consulted prior to handling any chemical whose properties the user is not familiar with.
2. Flammable solvents **must** be kept in cabinets (if volumes are large then these cabinets must be flameproof). No more than 100 litres of flammable solvent can be stored in each cabinet.
3. Flammable solvents and combustible organics **must** not be stored with oxidisers (hydrogen peroxide, sodium nitrate, hypochlorite) or any oxidising acid (conc nitric or perchloric acids).
4. If highly Flammable (Class 3.1A) solvents (e.g. ethers) are stored in refrigerators, these refrigerators **must** be spark-proofed (and the refrigerator labelled as such). Use of highly flammable (Class 3.1A) solvents is restricted to fume hoods.
5. Ethers such as diethyl ether and tetrahydrofuran **must** have date of purchase clearly written on container. Once opened, ethers such as diethyl ether **must** not be kept longer than 18 months without being tested for peroxides. If testing is not available, the ethers **must** be disposed.
6. Bulk flammable solvents in the laboratory **must** be kept to a minimum – use DG stores for bulk solvent.
7. Flammable liquids **must** not to be stored or used near sources of ignition.

8. Flammable liquids **must** be decanted and used in fume hood. The only exceptions will be Class 3.1B and C liquids that are diluted in aqueous solvents (e.g. ethanol and methanol).
9. No waste solvents are to be stored outside flameproof cabinets, unless the waste receptacles are attached to analytical machines.
10. Where liquids are stored inside cabinets there should be some form of secondary containment – flameproof cabinets have sumps which provide secondary containment.
11. Individual winchesters of liquid should be transported in a carrier.
12. Fume hoods **must** not be used for storage of chemicals with the exception of highly toxic gases or chemicals that leak toxic fumes.
13. Recirculating fume hoods **must** be clearly labelled with limitations of use.
14. All gas cylinders **must** be secured.
15. Cylinders of flammable gases **must** be used with a flashback arrestor when attached to a source of ignition.
16. Cylinders of flammable, toxic and oxidising gases must have cylinder key attached to cylinder when in use.
17. Particular care **must** be taken when storing and handling toxic and flammable compressed gases (users must consult and comply with SMOU 6).
18. Particular care **must** be taken when storing and handling Class 4 and 5.2 Reactive Compounds (users must consult and comply with relevant SMOU).
19. Class 4, 5.1 and 5.2 compounds **must** be segregated from combustible organics and flammable liquids.
20. Fume hoods will be used for handling Class 3.1, Class 4, toxic compounds and concentrated acids.
21. Highly toxic chemicals (Oral LD50 < 5 mg/kg) **must** be stored in a secure area or locked cupboard/refrigerator if the laboratory is not secure. A register should be kept of these toxic compounds (see SMOU for 6.1 compounds for more detail)

B. Highly Hazardous Chemicals

Where chemicals have highly hazardous properties, they may require additional measures over and above general safety rules provided by the General Safe Methods of Use.

The Lab Manager is referred to specific Safe Method of Use and to the specific MSDS. In particular:

Gases	SMOU 6
Reactive Solids	SMOU 8
Oxidisers	SMOU 9
Organic Peroxides	SMOU 10
Acutely toxic compounds	SMOU 11
Compounds with Chromic toxicity	SMOU13
Corrosives	SMOU 14

Note that for acutely toxic compounds in particular, users must consult MSDS sheets and ensure clear warning labels are present on all containers.

Particular Storage Requirements

1. Water sensitive compounds must be stored away from sources of water
2. Acids must be stored away from alkalis.
3. Oxidisers **must** be stored separately from flammable or combustible organic compounds and **must** never be stored with flammable solvents
4. Purchasing date of time sensitive compounds such as ethers **must** be recorded on bottle. Compound will be tested or discarded at the prescribed date (see SMOU for Peroxide –forming chemicals)
5. Desensitised explosive compounds such as picric acid **must** be checked every 6 months to ensure adequate levels water desensitising agent are present.

C. Compounds with Chronic Toxicity

Care **must** be taken to reduce exposure to any chemical (through the use of fume hoods and gloves). The adverse effects of some compounds are only evident after repeated low-level exposures (e.g. sensitising agents).

Particular care should be taken when MSDS sheets indicate a compound is teratogenic, mutagenic or sensitising agent. .

Fume hoods **must** be used when handling sensitising agents such as formaldehyde as well as many common solvents(xylene) to reduce inhalation hazard not only to the user but also to other laboratory personnel. Gloves of appropriate resistance) must also be worn when handling these compounds.

D. Disposal of Chemicals

With few exceptions all chemicals must be disposed by a licensed chemical waste contractor (see Chemical Safety Website for more details).

E. Work Alone or After-hours

1. Laboratory personnel working alone or after-hours must ensure they obtain prior permission from their supervisor.
2. Laboratory personnel working alone or after-hours must familiarise themselves with emergency procedures and have easy access to emergency telephone numbers.
3. It is strongly recommended that any person working after-hours notifies Unisafe when they enter the building and expected time of leaving.
4. In the case of some specific chemicals (e.g. HF) work alone or after-hours is specifically prohibited (these prohibitions are specific to chemical concerned and are included in the SMOU for that chemical).

F. Requirements for an Exempt Laboratory

1. Laboratory Management

1. Every Exempt Laboratory must have a Laboratory Manager.
2. Nominate 'Persons in Charge' of the Laboratory in the absence of the Laboratory Manager. Otherwise (unless the building has perimeter access control – FMHS, SBS or Liggins) the lab must be locked when Lab Manager or a 'Person in Charge' is not available.
3. There can only be one person in charge of the Laboratory at any one time. Therefore a hierarchy must be established.
4. All of the above must be in writing and all laboratory personnel must be aware of who is in charge of the laboratory at any given time.
5. It is suggested that a list giving name of the Laboratory Manager and Persons in Charge in order of hierarchy is posted in a prominent place in the laboratory or on a website.
6. An inventory of all containers of laboratory chemicals will have to be established giving identity of chemical and size of container.

2. Requirements of the Lab Manager

The Laboratory Manager or "Person in Charge" must:

1. Make themselves available to Emergency Services in the event of laboratory evacuation and must ensure any laboratory staff who can provide information to Emergency Services are also available.
2. Ensure all laboratory personnel have access and follow the Safe Method of Use for every category of chemical that is present in the lab. The General Rules above are extracted from specific SMOUs and should suffice. It is suggested that this material be put in a folder in the laboratory.
3. Ensure lab personnel know location of spill kits and protective equipment and how to operate this equipment.
4. Ensure lab personnel know which gloves are appropriate for the chemical they are using. Note that this information is available on the Chemical Safety Website

5. Ensure all laboratory personnel have access to and can extract information about any chemical in the lab from MSDS databases. Note that two MSDS databases (Chemweb Gold and CCOHS) are available within the University. Specific Safe Methods of Use should be consulted for more detail. Safe Methods of Use are available as pdf documents from H & S Website under Chemical Safety.
6. Ensure all laboratory personnel have access to a 24 hours emergency number.
7. Check (or arrange to have checked) all containers of chemicals to ensure they are not leaking, properly labelled. Particular attention should be paid to labels on containers of corrosive compounds.
8. Check to ensure chemicals are properly segregated.
9. Check to ensure opened containers of ethers are not stored for longer than 18 months.
10. Ensure there is adequate shelf-space assigned for chemical storage.
11. Identify any highly hazardous chemicals in the laboratory and ensure a hard copy of the MSDS is available

Note:

Labelling means that primary containers have the following information:

- Identity of compound
- Its concentration (if applicable)
- Warning label (a UN pictogram or written warnings on the label will suffice)

And all working containers must have the following information:

- Identity of compound
- Its concentration (if applicable)

Segregation means that acids and bases are not put together, Class 3 solvents and Class 4 reactive compounds or Class 5.1 oxidising compounds are not together.

Segregation can be achieved by distance or in some cases by enclosing small bottles of incompatible chemical in a plastic container.

3. Lab Management of Buildings

1. Nominate a HSNO Laboratory Facility Director and other persons to be in charge during his or her absence. As for Lab Managers, this nomination must be in writing.
2. Nominate lab managers for each laboratory or set of laboratories.
3. Nominate 'Persons in Charge' of the Laboratory when the Lab Manager is absent for longer than three days.
4. The requirements of each Lab Manager are those specified in Section B above.

4. Requirements of the Lab Personnel

All laboratory personnel must:

1. Use protective equipment as directed by the Safe Method of Use on Personal Protective Equipment with particular attention to safety glasses and the use of correct type of gloves.

2. Make themselves available to the lab manager and Emergency Services if they are able to provide information relevant to the emergency.
3. Read and follow Safe Method of Use for the category of chemical they are using (the above general rules will cover most situations).
4. Follow Safe Method of Use on Basic Laboratory Practice.
5. Ensure (in writing) that the Laboratory Manager is aware of any acquisition of chemical for which there is no Safe Method of Use.
6. Ensure laboratory is locked when either Lab Manager or Person-in-Charge is absent.
7. Destroy any warning labels on packaging before discarding the packaging.
8. Report any leaking container or malfunctioning equipment to the Laboratory Manager.
9. Know the location of spill kits and protective equipment.
10. Know how to deal with spill of any chemical in the laboratory.

Reporting Accidents and Incidents

- All accidents and incidents **must** be reported to Laboratory Manager
- All accidents and incidents **must** be reported to University Health and Safety Office **on the prescribed University Accident/Incident form**
- Accidents involving splashes to the eye may require reporting to OSH. These accidents **must** be reported as soon as possible to the University Health and Safety Office.