

*Chem 226: General Safety Regulations & Lab Guidelines*  
([Printable .pdf file](#))

### Safety Regulations

- Any unauthorized experiments are prohibited.
- Students are not allowed in the laboratory outside of scheduled hours unless an instructor is present.
- Safety glasses must be worn at all times when in the laboratory.
- Shorts and open toe footwear are prohibited in the laboratory.
- All food and beverages are prohibited in the laboratory.
- Experiments in progress must not be left unattended.
- Experiments are not to be left overnight or stored, unless instructed to do so.
- Accidents must be reported immediately to the laboratory instructor.
- Learn the locations of the nearest telephone, fire extinguisher, eye wash station, emergency shower, and first aid kit, as well as exit routes from the laboratory and the building.

*MSDS sheets provide information concerning the hazards of any particular chemical. They are available for all chemicals used in the laboratory. They can be accessed on-line. Hard copies are kept in the stockroom and are available by request from the stockroom coordinator.*

### Chemical Handling & Hygiene

- Pay attention to any hazards and warnings that may be given for each experiment.
- Take great care to avoid contaminating reagents. Always replace bottle tops as soon as you have finished dispensing reagents since many compounds react with moisture in the air, with oxygen or with carbon dioxide. Others are volatile and evaporate. Do not mix the tops. If you do remove the reagent from the common work area temporarily, replace it as soon as possible.
- Never put the “wrong” pipette or spatula into the “wrong” reagent bottle.
- Always pour from the side of the bottle away from the label so that the name is not rendered unreadable. A reagent with no label at best is useless; at worst is dangerous.
- Extreme caution should be used when mixing certain chemicals. If in doubt ask your laboratory instructor. Be especially careful when dealing with waste since certain types of waste are incompatible (e.g. concentrated sulfuric acid and/or oxidizing agents with any organic waste).
- Carefully observe the warnings about mixing water with certain reagents e.g. water should never be poured into concentrated sulfuric acid, or brought into contact with sodium metal.
- Noxious chemicals are to be handled in a fumehood. Generally, if a chemical or reagent is in the fume hood, use it in the fume hood.
- Never handle or pour flammable liquids in the open lab near an open flame or other ignition source.
- Never heat flammable liquids to boiling without taking proper precautions to avoid ignition of the vapor.
- Several of the compounds that you will use will have toxicities such that they are considered to be poisons e.g. some alcohols, amines and nitriles. Therefore, the regulations concerning eating and drinking in the laboratory must be strictly adhered to. A number of substances can be absorbed relatively easily through the skin e.g. dimethyl sulphate, nitrobenzene, aniline, phenol, and phenylhydrazine. Acids and bases are extremely corrosive and will damage skin and clothing. Certain organic compounds will stain.
- Always minimize contact with any chemical and wash with water after accidental contact. You may wear latex surgical or other protective gloves, if you wish.
- If harmful, irritating fumes or flammable gases are used or produced during a reaction, then that part of the experiment must be conducted in the fume-hood.
- Do not pipette liquids by mouth.
- Avoid exposure.
- To avoid the possibility of chemical spills, keep your work area organized and free of clutter. Wipe up small chemical spills and bottle rings immediately. In the event of a large accidental spill inform your laboratory instructor immediately, and then clean up.
- At the end of the laboratory period, make sure that the hoods, your work area, sinks, and balances are clean and the way you would want to find them when you enter the lab. Put away all equipment and be sure that your lab drawer is locked. Wash your hands before you leave.

### Accidents/Emergencies

- In case of an emergency, inform the instructor immediately. If necessary use the laboratory telephone or cell phone and dial for assistance.
- Minor, non life-threatening injuries dial Police Services dispatcher: x2333
- Fire or major incident dial 911 (from Lab phone: 9-for an outside line then 911)
- If volatile vapors from a flask or beaker ignite, a small fire can be extinguished by gently placing a cover, eg. watch glass, notebook, or wire gauze, over the top of the vessel. Under no circumstances move the container. If a fire extinguisher is used, always take the fire extinguisher to the fire. If solvent that is spilled on bench tops ignites, if possible, move bottles and flasks of solvent away from the burning area and then use the fire extinguisher. Never use water, nor the fire extinguisher wildly or the fire may spread. If your clothing is set on fire, move under the nearest safety shower and pull the chain or wrap yourself in the fire blanket if it can be reached.
- Beware of burns from hot glassware, hot iron rings or hot plates. If burned, treat the skin with cold water or ice immediately and inform your instructor.
- Explosions are very fast exothermic reactions that release a large amount of energy and usually involve substances which undergo redox reactions e.g. polynitro compounds such as T.N.T. (trinitrotoluene), picric acid (trinitrophenol) or nitroglycerin, or by substances which can decompose to give much more stable compounds such as peroxides, azides, fulminates and diazo compounds. You will not be working with any particular explosion hazard with the compounds that you will be using. However, if procedures are not followed carefully and the wrong chemicals or procedures are used, an unexpected reaction may occur which could be explosive. One common causes of unexpected explosions results from distilling solutions to dryness, leaving behind traces of explosive residues such as peroxides. This is one reason why a distillation vessel must never heated to dryness.
- In the event of accidental skin contact, wash the area immediately with copious amounts of cold water, and inform your laboratory instructor.
- If you do splash something into your eyes wash them thoroughly with water (for about 15 minutes) by means of the eye wash. Contact lenses must be removed immediately in order to wash the eyes.

### Solvent Recovery & Waste Disposal

*These are very serious issues. Think about what you are doing. This is for your safety, to protect our environment, and to minimize waste. Never overfill waste containers (there must be at least 5cm air space at the top). If a container is full, then ask for a replacement.*

- Recovered solvents should be placed in the recovery bottles provided in the fume hood. additional, specific warnings will be issued as required.
- Never pour waste chemicals down the sink other than very dilute aqueous, non-toxic inorganic solutions. any broken glassware should be collected into a beaker and cleaned (rinsed with solvent and then water) before disposing of the broken glass in the special broken glass waste container in the back of the lab.
- Solid chemical waste should be placed in the container provided in the fumehood.
- Liquid organic solutions should be placed in the labeled containers in the fumehood.
- Aqueous metal solutions should be placed in the aqueous metal waste container in the fumehood.
- Sample vials should be placed in the wire baskets provided at the front of the lab.
- Pasteur pipettes should be placed in the special “sharps” container specifically for them.

*If in doubt about disposal, consult a copy of Sigma-Aldrich Chemical Co. catalogue at the front of the lab. It includes disposal information on all chemicals they sell and are the source for most of our lab chemicals. If still uncertain, ask your laboratory instructor. keep the waste disposal area clean.*

*rjr: 8/08*