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*General Safe Practice*

A.

and washing with water are not effective in removing chemicals that have been splashed into the eye. The contact lens traps contaminants very efficiently and holds them against the eye surface. Hazardous vapours can also be caught and held behind the lens. Soft lenses are particularly bad because gases readily pass through the lens and dissolve in the eye's layer of moisture behind the lens.

Also, it is extremely difficult to remove a contact lens from an eye that contains foreign matter. Reflex squinting and blinking make it nearly impossible to remove the lens to facilitate better flushing.

**(e). References:**

Further information on eye protection can be obtained from the following sources:

- (i) CRC Handbook on Laboratory Safety, Ed. N. V. Steere.
- (ii) Catalogues from safety supply companies.
- (iii) The internet.

**2. Working Alone.**

**NO PERSON SHALL PERFORM CHEMICAL EXPERIMENTATION ALONE IN THE DEPARTMENT UNLESS A SECOND PERSON PRESENT IN THE DEPARTMENT IS AWARE OF HIS OR HER PRESENCE**

**Supervisors, also note WorkSafe BC regulation: “If you expect an employee to work alone, you must implement a written procedure for checking the well-being of a worker assigned to work alone or in isolation under conditions which present risk of disabling injury if the worker might not be able to secure assistance in the event of an injury or other misfortune.”**

**(a.) Notification:**

Research workers are required to notify others in the building that they are present and intend to work in the lab. If you have been so notified, you should inform the person when you leave the building. It is also strongly recommended that all personnel working after hours use the Campus Alone program. Contact Campus Security at 250-721-6683 and let them know who and where you are and when you plan to leave. Campus Security will make every effort to visit you while you are working, and if they don't receive a call advising of your departure they will follow up and check on you. For more details see: <http://web.uvic.ca/security>

**(b.) Routine Work:**

The rule against solitary work does not prohibit routine inspection, e.g. the servicing of vacuum lines with refrigerants, the checking of experiments with long reaction times. However, initiating operations or reaction sequences likely to be hazardous late in the day or at the end of the week should be strictly avoided.

**(c.) Undergraduates:**

An undergraduate may not undertake experimental work except in the presence or close supervision of a qualified laboratory instructor or research supervisor.

**2. Smoking, Eating and Drinking****(a.) Smoking:**

that the door locks behind you. If it does not, call Cam

**B. CHEMICAL MANAGEMENT**

- (d.) Recognise that commercial refrigerators constitute a unique hazard in that explosions may occur when they are used for storage of volatile flammable materials. Volatile flammable materials may be stored in stoppered containers in "explosion proof flammable storage" refrigerators. Fridges which are *not* labelled "flammable storage" should contain only relatively non-volatile materials.

### 3. **Waste Disposal.**

#### **Chemicals:**

Disposal of all waste chemicals is handled through Occupational Health, Safety & Environment. Containers for collection of waste solvents, and other common wastes (see page following this section), are available from Stores. Full containers are collected by OHS every Thursday. All hazardous chemical wastes must be itemized on the online hazardous waste form, as follows:

(from <https://www.uvic.ca/ohse/environment/waste/index.php>)

## **Hazardous waste**

The hazardous waste management system is designed to deal with hazardous wastes on campus in an environmentally responsible manner; maintaining compliance with local regulations and demonstrating a best practices approach to environmental safety.

Please complete the [hazardous waste disposal form](#) to request a pick-up of your hazardous waste.

**Pick-up is every Thursday, and requests must be in Wednesdays by 4:00 pm.**

To log-in to the system, use your Netlink Id and password.

Please [ensi3000375005c0025 T.2 Tm0 cesdinkersousvesswch to prna63m0 cesabem0 cesdihhch nd5.94\(6n\)-1](#)

**Non-chemical waste disposal:**

- Sharps (needles, blades and small amounts of broken glass) must be placed in sharps containers, available from Science Stores, and then sent for disposal via the OHS hazardous waste program.
- Non-hazardous wastes should be physically separated, for removal by the maintenance staff, into the following types:
  1. Glass. (When reasonable, try to dispose of broken glass in the sharps containers.) For larger bottles use the central depositories in the Elliott and Bob Wright loading bays.
  2. Paper, tins and other miscellaneous inert materials.

**4. Chemical Storage.**

The Department recognises the need to store some frequently used chemicals essential to current projects in the working part of laboratories. At the same time seldom used items and chemicals no longer in active use should not be kept on a long-term basis in the laboratory area. It is the responsibility of research workers to control the amounts and diversity of chemicals in the working area.

The following facilities are provided to achieve these aims:

- (a.) flammable storage cabinets - for actively used solvents and flammables;
- (b.) under the fume hood compartmentalized storage - for acids, bases, lachrymators, active metals, hydrides and malodorous compounds;
- (c.) shelving - for general inorganics and organics.
- (d.) chemical storage rooms are available for the labs in the Bob Wright Centre.

**DO NOT store incompatible chemicals together (e.g. DO NOT store nitric or sulphuric acid with flammable materials).**



*Em*

## A. FIRE AND EXPLOSION

### 1. Extinguishers:

## B. TOXIC FUMES, GASES AND LIQUIDS

### 1. Evacuation:

If a release of a toxic or a noxious chemical (stench, respiratory effect, ammonia) occurs through gas escape or spill in an amount sufficient to cause a hazard, immediately vacate the room, closing the door. Call Campus Security, 7599, and evacuate the building.

### 2. Rescue:

In the case of an incident where a worker has been overcome by gas, **call 911 and 250-721-7599 (Campus Security) immediately.**

## C. CORROSIVE CHEMICALS

### 1. Shower:



## E. ELECTROCUTION



### 1. Rescue:

**DO NOT TOUCH THE VICTIM UNTIL THE POWER IS CUT.** Know where the power breaker is for your research or undergraduate laboratory area. In labs where the power cut-off is overhead, know where the pole is for breaking the switch. Store this pole in a visible, convenient location.

### 2. CPR:

After rescue, begin Cardio-Pulmonary Resuscitation if breathing has ceased. You cannot

**IT IS DEPARTMENTAL POLICY TO OBTAIN MEDICAL ASSISTANCE FOR ALL INJURIES AND MEDICAL EMERGENCIES.**

**2. First Aid Knowledge:**

A knowledge of elementary general first aid is essential, particularly as it is related to common laboratory accidents. A convenient short summary is found in the C.R.C. Handbook on Safety, pages 19-30. Introductory first aid classes are held every September for new personnel. Thi

## *Properties of Hazardous Materials*

### **A. GENERAL**

Workers should familiarize themselves with the hazardous properties of chemicals and reagents before use. Every lab should retain Safety Data Sheets for all hazardous materials used. There are many excellent sources of information on the internet, including UVic OHSE website, [www.uvic.ca/ohse](http://www.uvic.ca/ohse) .

Remember that many potential accidents associated with synthetic work can be avoided by merely **cleaning up** glassware immediately after reactions are completed, thus not allowing harmless materials to be converted by air and time to hazardous chemicals





- (iv) Do **NOT** cool carbon steel gas tanks with liquid nitrogen - they may explode.
- (v) Remember at all times that vacuum lines can implode violently and avoid storing chemicals behind a working line. Exposed vacuum pumps must have belt guards.
- (vi) Tape all Dewar flasks and vacuum desiccators to prevent violent shattering in case of breakage.

(b) Liquefied Gases

- (i) Beware of condensation of oxygen from the air into liquid nitrogen and its subsequent concentration by loss of the nitrogen to form a highly oxidizing mixture.

Use liquid nitrogen only with high vacuum systems.

Do not use liquid nitrogen to cool tubes prior to sealing unless the tube is attached to a high vacuum line, otherwise air may condense in the tube and cause an explosion when the tube is brought to room temperature.

- (ii) If a vacuum line develops a leak in the manifold while the trap is liquid nitrogen cooled, recognize that condensation of oxygen will occur in the trap. Do **NOT** isolate the trap or attempt to remove the Dewar flask, as the expanding oxygen will cause a pressure explosion of the trap.
- (iii) Never seal a reaction vessel under argon gas at liquid nitrogen temperature. Argon will condense at this temperature, leading to violent explosions as the liquid argon converts back to gas on warming.



SAFETY EQUIPMENT1. FIRE EXTINGUISHERS

The following are available in or near each laboratory:

- (a) CO<sub>2</sub> Extinguishers: Applicable to flammable liquid and minor electrical fires (Note: Water is preferable for paper fires in waste baskets, wood, cloth, etc.) Do not direct the CO<sub>2</sub> near a person's face. Do not use either CO<sub>2</sub> or water on sodium, potassium or lithium metal fires.
- (b) All-purpose Dry Chemical: Applicable to all classes of fires (ABC), except those caused by active metals. A heavy clean-up problem makes sand, sodium bicarbonate or CO<sub>2</sub> preferable for small fires. Do not use on electronic equipment as it will be destroyed.
- (c) Bucket of Sand: Use for fires caused by active metals and to contain small fires in modestly flammable materials.

**N.B.** Report all uses of fire extinguishers, however minor, to the Admin Officer to arrange for a replacement. A partially used extinguisher may leak, creating danger for the next worker who needs it.

2. SAFETY STATION

Each research and teaching laboratory, service area and instrument room where active chemical experimentation is undertaken contains the following equipment at a location designated as the "Safety Station".

- (a) Emergency Shower and Eyewash Fountain: The showers provide continuous water flow for as long as the chain/handle is pulled down. After use, contact Facilities Management for clean-up assistance. The eyewash fountain is hand- or foot-operated. As routine, research workers are asked to flush the eyewash fountains at intervals of several days to clear rust from stagnant lines.
- (b) First Aid kit: The following items are stocked in each first aid kit:
 

1 First Aid manual	1 pair scissors (sharp, blunt end)
1 pkg safety pins	1 pkg cotton-tip applicators (sterile)
2 each triangular bandages	1 pkg assorted plastic strips (bandaids)
2 each Tensor bandages	1 roll 2" x 5 yds adhesive tape
1 roll 1" x 5 yds adhesive tape	1 box 2" x 3" sterile pads (Telfa)
1 roll 1" gauze bandage	1 roll 2" gauze bandage
3 each large pressure dressings	3 each small pressure dressings

**NOTE:** Be sure to replace anything that is used. Supplies are available

from the Chemistry General Office.

- (c) Emergency Power Cut-Off: Know where the emergency cut-off is for your lab. For labs where the cut-off is in the ceiling, a stick for operating the lever must be at the safety station or circuit panel.
- (d) Gas and Water Cut-Off: Know where the natural gas and water are shut off in your laboratory.

### 3. SPILL KITS

For small (1 L or less) solvent, acid or base spills, Spill Kits are available at no charge from Science Stores.

### 4. LOCATION OF SAFETY EQUIPMENT

As soon as you have settled into your laboratory area, you should find the locations of specific safety equipment which you may need in an emergency. This includes safety shower, fire extinguishers, fire blanket, first aid kit, spills trolley, and so on. Know where to find the emergency telephone numbers and the nearest fire alarm pull station. Plans showing the location of safety equipment are posted strategically around the buildings.

### 5. SCIENCE STORES

Science Stores stocks many safety items for personal protection and supplies for safe working practices.

## EMERGENCY EVACUATION OF THE CHEMISTRY DEPARTMENT

On hearing the building FIRE ALARM all individuals are required to vacate the building immediately. Experimenters should secure apparatus sufficiently to prevent secondary fire or gas hazards from developing, and close windows and doors (do not lock doors). Emergency Floor Coordinators should proceed as noted below. The local fire department has approved the departure routes listed below.

If conditions permit, each Emergency Floor Coordinator should carry out the following procedures on hearing the building alarm:

- i) Ensure that all persons have evacuated the rooms assigned to his or her exit (see below).
- ii) Close hallway doors of the rooms assigned to his or her exit.
- iii) Close the fire doors at the exits to the area under his or her control.

In the case of a fire in his or her assigned area, a floor coordinator should ensure that the alarm has been transmitted to the local fire department (911) or to the University switchboard. Bear in mind that the attempted rescue of persons in chemistry laboratories may be extremely dangerous and may require an independent air supply respirator - contact 911 and 250-721-7599.

Emergency Coordinators should, upon arrival of the fire department, advise the senior officer present of any relevant problems within their area of concern.

### RECOMMENDED EXITS DO NOT USE THE ELEVATOR

**The local fire department has approved the departure routes listed below:**

1. **ELLIOTT OFFICE WING STAIRCASE** (East [parki in ; T M

234-255 offices, labs  
 017-020 labs & shops

4. **ELLIOTT LECTURE WING WEST EXIT:**

**Rm(s):**            **Description:**

066, 066a-d labs  
 165, 166 offices

5. **PETCH EAST STAIRCASE:** (East side of Petch building)

**Rm(s):**            **Description:**

272/5/6 labs, offices  
 091 machine shop

6. **PETCH CENTRAL STAIRCASE:** (North side of Petch building)

**Rm(s)**            **Description**

057-059 Labs, offices  
 068-071 Labs, offices

7. **WRIGHT - N T oRA f \$            \$**

**WRIGH**

## APPENDIX IV

**DIRECTORY OF SAFETY-RELATED AGENCIES AND PERSONNEL**

The following agencies and personnel may be useful in obtaining help or information on safety-related matters. Also, do not forget the emergency numbers below the emergency telephones on the second and third floor landings, and affixed to your telephone set.

<b>Ambulance/ Fire/ Police</b>	<b>911</b>
<b>Campus Security</b>	<b>250-721-7599</b>
Department Safety Officer	250-721-7184
Department Chair	250-721-7150
Department Administrative Officer	250-721-7153
Poison Control Centre	9-250-595-9211
UVic Health Services	250-721-8492
UVic Occupational Health, Safety and Environment	250-721-8971