CHEMICAL HYGIENE PLAN

GENERAL INFORMATION

The Chemistry/Life Science Department at Southwestern Oregon Community College has developed the following Chemical Hygiene Plan for use by our employees. The intent of this plan is to identify safety and health guidelines to be used when working with hazardous chemicals or conducting hazardous processes.

The plan will be updated when new chemicals, processes, or additional information about hazards are received by the department.

The Chemical Hygiene Officer (CHO) is the employee who has been given added responsibility for the overall safety and health program for these laboratories. The CHO is listed below and has been selected because of her/his knowledge of the processes and the occupational safety and health aspects of working with the chemicals in our labs.

Chemical Hygiene Officer: Mike Springer

The Chemical Hygiene Plan will be available in the following locations:

Coaledo 2 – Chemistry Lab
Coaledo 6 – Biology Lab
Facilities

Safety Data Sheets will be available in the following locations:

Coaledo 2 – Chemistry Lab
Coaledo 3 – Biology Lab

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Section I

GENERAL LABORATORY SAFETY AND HEALTH PROCEDURES

Chemistry Lab/Biology Lab

1. Safety glasses or goggles must be worn when appropriate to guard against laboratory accidents. If contact lenses are worn, goggles must be worn without exception.

2. Wear old clothing or use lab coat or apron. No shorts or short skirts.

3. Wear only shoes that shed liquids. Sandals or canvas shoes are not permitted.

4. Tie back long hair near open flames.

5. Wash hands and arms thoroughly before leaving the lab. Whenever the skin comes into contact with laboratory chemicals, wash thoroughly and quickly with soap and water. Use eyewash fountain to flush chemicals from eye. If a chemical is spilled over a large part of the body, use the safety shower and flood the affected area for 5 minutes. Remove contaminated clothing.

6. Report all accidents or injuries, even minor. Complete an Incident/Injury Report found on the Administrative Services webpage. Submit to Administrative Services within 24 hours or sooner.

7. No one should ever work alone in the laboratory. An instructor should be present. If you must work alone, tell someone that you are going to be in the lab, so they can periodically check on your safety.

8. No smoking, eating, drinking, or chewing permitted in the labs. Keep pencils and other objects out of mouth. Chemicals or microorganisms may enter through mouth or lungs.

9. If the release of a toxic or hazardous substance may occur, the work should be done in a fume hood designed for the chemical released.

10. Chemicals should be handled carefully at all times, using appropriate containers or carrying devices.

11. Label secondary containers.

12. Don't set up equipment that blocks the means of egress from the lab.

13. Open containers should be closed after use, and unneeded reagents should be returned to storage.

14. Know location and use of fire equipment in the lab. Be aware of posted emergency exit routes.

15. All broken glassware is to be put in a special box labeled "broken glass".

16. Follow good housekeeping practices. Clean up after lab work is completed, including cleaning of microscope (if used). Wipe off tabletop with disinfectant provided.

17. All new chemicals will be dated and entered into inventory when they first arrive.

SPECIFIC CHEMICAL HAZARDS

A. Flammable/Combustible Materials
   1. Store all flammable liquids in appropriate cabinet or explosion-proof refrigerator.
   2. Heat flammables using a heat mantle or steam bath, never a direct flame.
   3. Work with flammable/combustibles should be performed in fume hoods.
   4. Work only in fire protected areas with portable fire extinguishers readily available.
   5. No source of ignition should be in the vicinity of flammable liquids, either as part of the experiment or simply nearby.
   6. Store flammables in glass or plastic.

B. Corrosive Materials – Acids and Bases
   1. Always wear goggles, gloves, and apron when handling or working with corrosives.
   2. Know how to use eyewash station and deluge shower.
   3. Always add the concentrate to the diluted solution or water. Never add water to acid.
   4. Store acids with acids, bases with bases. Exception: Sulfuric Acid and Nitric Acid are incompatible.
   5. Keep containers not in use in storage. Store all corrosives on lower shelves.

C. Ethers
   1. Mark the date of receipt on all ether containers.
   2. Ether to be stored in explosion-proof refrigerator in equipment room.
   3. Dispose of any unused ethers in open containers immediately.

D. Reactive Metals
   1. Store reactive metals under proper suppression materials such as mineral oil for sodium.
   2. Fire extinguishers in labs with sodium should be Class D.
   3. Use barriers to protect others when working with sodium in the lab.

E. Compressed Gases
   1. All gas cylinders must be secured to prevent tipping over.
   2. Gas cylinder storage must be away from flammable/corrosive fumes or chemicals, direct heat, open flames or sparks and must be located in a cool, dry place.
   3. Incompatible gases must be segregated.
   4. When gas cylinders are not in use, a valve cap should be securely in place to protect the valve stem and valve.

BIOHAZARD – LEVEL 1 (MICROBIOLOGY)

1. Access to the laboratory should be limited or restricted, at the discretion of the laboratory instructor, when experiments are in progress.

2. Work surfaces are to be decontaminated after each lab is completed. Any spill of viable material is to be decontaminated immediately.

3. All contaminated liquid or solid wastes must be appropriately decontaminated prior to disposal.

4. Pipette pumps must be used. Mouth pipetting is prohibited.

5. No eating, drinking or smoking in the work area.

6. Hands must be washed with a disinfectant soap after handling viable materials and before leaving the lab.

7. Lab coats or aprons should be worn over street clothing while working in the lab. These articles should not be worn away from the lab.

8. All “sharps” and blood contaminants are to be put in a special box labeled “sharps”.

9. Any lab procedure using body fluids to be carried out only by individual on own samples.

10. Use gloves when handling preserved specimens.

CARCINOGENS

The following regulated carcinogenic materials are in stock:

benzene
benzidine
arsenic
formaldehyde 37%

1. Protocols must be reviewed by CHO before use of a regulated carcinogen or prior to purchase of a carcinogen not currently in stock.

2. The carcinogen must be isolated in a specific work area, and access to that area must be restricted to designated personnel.

3. Use of carcinogens in labs should be limited and good controls should be provided.

4. Records of personnel working with carcinogens must be kept and maintained for thirty (30) years.

Section II

CONTROLS

PERSONAL PROTECTIVE EQUIPMENT

Eye Protection

1. Goggles will be provided for all persons present in locations where chemicals are stored or handled. Goggles must meet ANSI standard Z 87.1.

2. Where procedures are being used in which chemicals could splash and injure the eye, goggles must be used. These procedures shall include working with corrosives, explosives, and highly toxic chemicals. Goggles may be worn during the initial dissection phase of specimens in biology and anatomy lab.

3. A face shield shall be worn when maximum protection from flying particles or explosions may occur.

4. Goggles will be sanitized in appropriate UV cabinet between uses.

Hand Protection

1. Before using any hazardous chemical that may spill on your skin, review the MSDS and determine the appropriate glove material.

2. Gloves will be worn when handling materials likely to puncture, cut or irritate the hand.

3. Heat resistant gloves must be worn when handling hot materials.

Body Protection

1. Lab coats or aprons must be worn when working with chemicals that may spill or splash.

2. Any lab coat or apron contaminated with a highly toxic chemical must be disposed of properly.

HYGIENE PRACTICES

Eyewash and Shower

1. An emergency shower is available in the chemistry lab for use in the event of a major spill.

2. An eyewash station is available in the labs.

3. All personnel should be trained in the location and use of the safety shower and eyewash facilities.

4. These facilities will be tested at least once every six months and be maintained in good working order.

Personal Hygiene

1. Wash hands thoroughly before leaving lab.

2. Protective lab clothing must be properly laundered. Do not leave the lab facility with the protective garments.

FIRE PROTECTION

1. There are fire extinguishers – Class D – located in the front of the biology lab and in both the front and back areas of the chemistry lab.

2. All persons should receive training in the use of these fire extinguishers prior to beginning work in the labs.

3. Evacuation routes are posted at the door to each lab. There is one primary exit door to each room. Windows open outwards and may also be used as secondary escape routes.

4. Primary containment procedures will include:
   a. Remove source of fuel by turning off main gas valve.
   b. Smother fire using CO_2 extinguisher.

5. In the event of a fire in which primary containment procedures do not work:
   a. The lab will be evacuated.
   b. The fire alarm bell at the outside exit door will be activated.
   c. Campus security will be notified.

6. Evacuation drills will be conducted at least annually.

VENTED HOODS

1. When laboratory work may result in implosions or explosions, the fume hoods will be used.

2. Any transfer of chemicals where dust contamination or fume contamination is possible must be done using the fume hoods. See individual MSDS.

3. Regular maintenance of the fume hoods will be scheduled by the Chemical Hygiene Officer yearly. Points to check will include obstruction of slots and concealed space between slots, leaks, or obstructions in ducts, and the condition of the fan.

4. Smoke tubes will be used to evaluate hood face velocity and outleaks in the duct system. This routine evaluation will be completed yearly.

SPILLS

1. Accidental release or spills of chemicals must be cleaned up immediately under the supervision of persons who are knowledgeable in the hazards involved and the precautions to be taken.

2. Use the spill kits in the chemistry lab to contain larger spills.

3. Evacuate the room if the spill has presented a vapor or fire hazard.

Section III

EXPOSURE MONITORING

An area exposure-monitoring program will be conducted for possible health hazards in the biology lab during dissection of preserved specimens.

Initial monitoring will be conducted for formaldehyde gas and follow-up monitoring will be done based on the exposure levels found and/or if experimental procedures change.

Monitored levels will be recorded, this record to be maintained by the CHO.

Section IV

MEDICAL ASSURANCE PROGRAM

If any one of the following events occurs, a medical examination must be given to an employee who requests testing under the OSHA rules:

1. Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, the employee shall be provided an opportunity to receive an appropriate medical examination.

2. Where exposure monitoring reveals an exposure level routinely above the PEL for formaldehyde, medical surveillance shall be established for the affected employee as prescribed by OSHA.

3. Whenever an event takes place in the labs such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee shall be provided with the opportunity for a medical consultation. Such consultation shall be for the purpose of determining the need for a medical examination.

When an examination is performed because of the three above listed events, the following information must be gathered and provided to the physician:

1. The identity of the hazardous chemicals to which the employee may have been exposed.

2. A description of the conditions under which the exposure occurred including: quantitative exposure data, if available.

3. A description of the signs and symptoms of exposure that the employee is experiencing, if any.

The employer shall be provided with a written opinion from the examining physician that shall include the following:

1. Any recommendations for further medical follow-up.

2. The results of the medical exam and any associated tests.

3. Any medical condition that may be revealed in the course of the examination that may place the employee at increased risk as a result of exposure to a hazardous chemical found in the work place.

4. A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination.

Section V

PRIOR APPROVAL PROCEDURES

Any non-routine type of work done in the labs must receive prior approval. This would include use of highly toxic chemicals, extremely hazardous processes, or procedures or processes that have resulted in uncontrolled reactions.

The prior approval process shall include:

1. The project must be planned and developed in writing.

2. An inventory of chemicals to be used must accompany the plan.

3. A check must be made to ensure that all the safety equipment required is available.

4. Develop a spill response plan (for any new chemical added to inventory).

5. Assure proper waste disposal.

Section VI

CARCINOGENS

Only authorized, trained employees are permitted to enter and/or work in the regulated chemical stockrooms where carcinogens are stored. Employees who work with these chemicals shall receive special training in the hazards and control systems. Personal protective equipment will be worn at all times when handling carcinogenic chemicals.

Section VII

EMPLOYEE TRAINING

Each laboratory employee shall receive training at the time of initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations.

Refresher training on the Chemical Hygiene Plan will be conducted at least annually for all employees in the labs.

Training to include:

1. Explanation of occupational exposures to hazardous chemicals standards, PEL's for OSHA regulated substances and exposure monitoring.

2. Location and availability of Chemical Hygiene Plan.

3. Signs and symptoms associated with exposure to hazardous chemicals used in the laboratory.

4. Location of reference materials, MSDS.

5. Known physical and health hazards of chemicals in the work area. Review of labeling codes and procedures.

6. Review use of personal protective equipment.

7. Review emergency response procedures.

8. Review safe lab procedures – i.e. glassware, heat mantles, equipment and procedures.