CHEMICAL HYGIENE PLAN FOR

Ryckman Lab

ISB 206(206A)

Last updated: Jan 22, 2024

Principal Investigator: (**Brent Ryckman**)

GENERAL

The general intent of the chemical hygiene plan is to protect laboratory employees from health hazards associated with the use of hazardous chemicals in our laboratory.

The plan will be available to all employees for review and a copy will be located in the following areas:

ISB 206; in a binder on the bookshelf above the north most desk space near exterior windows. MSDS are available on-line, accessed as hyperlinks from the chemical inventory Excel file on the lab computer located by by the exterior windows.

Brent Ryckman is designated as the Laboratory Supervisor.

This plan will be reviewed annually by the laboratory supervisor and updated as necessary.

I. STANDARD OPERATING PROCEDURES to be followed in the laboratory relevant to safety and health when using chemicals.

1. General Rules

The following should be used for essentially all laboratory work with chemicals:

(a) Accidents and spills - Eye Contact: Promptly flush eyes with water for a prolonged period (minimum 15 minutes) and seek medical attention.

Ingestion: Encourage the victim to drink large amounts of water unless contraindicated by the MSDS or a physician..

Skin Contact: Promptly flush the affected area with water and remove any contaminated clothing. If symptoms persist after washing, seek medical attention.

Clean-up. Promptly clean up spills, using appropriate protective apparel and equipment and proper disposal.

(b) Avoidance of "routine" exposure: Develop and encourage safe habits; avoid unnecessary exposure to chemicals by any route;

Do not smell or taste chemicals. Vent apparatus which may discharge toxic chemicals (vacuum pumps, distillation columns, etc.) into local exhaust devices.

Inspect gloves and test glove boxes before use.

Do not allow release of toxic substances in cold rooms and warm rooms, since these have contained recirculated atmospheres.

(c) Choice of chemicals: Use only those chemicals for which the quality of the available ventilation system is appropriate.

(d) Eating, smoking, etc.: Eating, drinking, smoking, gum chewing, or application of cosmetics in areas where laboratory chemicals are present is prohibited except in designated and marked areas; wash hands before conducting these activities.

Do not store, handle, or consume food or beverages in storage areas, refrigerators, glassware or utensils which are also used for laboratory operations.

(e) Equipment and glassware: Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware. Use extra care with Dewar flasks and other evacuated glass apparatus; shield or wrap them

to contain chemicals and fragments should implosion occur. Use equipment only for its designed purpose.

(f) Exiting: Wash areas of exposed skin well before leaving the laboratory.

(g) Horseplay: Practical jokes or other behavior which might confuse, startle or distract another worker is prohibited.

(h) Mouth suction: Do not use mouth suction for pipetting or starting a siphon.

(i) Personal apparel: Confine long hair and loose clothing. Wear shoes at all times in the laboratory but do not wear sandals or perforated shoes.

(j) Personal housekeeping: Keep the work area clean and uncluttered, with chemicals and equipment being properly labeled and stored; clean up the work area on completion of an operation or at the end of each day.

(k) Personal protection: Assure that appropriate eye protection is worn by all persons, including visitors, where chemicals are stored or handled.

Wear appropriate gloves when the potential for contact with toxic materials exists; inspect the gloves before each use, wash them before removal, and replace them periodically.

Use appropriate respiratory equipment when air contaminant concentrations are not sufficiently restricted by engineering controls, inspecting the respirator before use.

Use any other protective and emergency apparel and equipment as appropriate.

Remove laboratory coats immediately on significant contamination.

(l) Planning: Seek information and advice about hazards, plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation.

(m) Unattended operations: Leave lights on, place an appropriate sign on the door, and provide for containment of toxic substances in the event of failure of a utility service (such as cooling water) to an unattended operation.

(n) Use of hood: Use the hood for operations which might result in release of toxic chemical vapors or dust.

As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a TLV of less than 50 ppm.

Confirm adequate hood performance before use; keep hood closed at all times except when adjustments within the hood are being made; keep materials stored in hoods to a minimum and do not allow them to block vents or air flow.

Leave the hood "on" when it is not in active use if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is "off".

(o) Vigilance: Be alert to unsafe conditions and see that they are corrected when detected.

(p) Waste disposal: Assure that the plan for each laboratory operation includes plans and training for waste disposal.

Deposit chemical waste in appropriately labeled receptacles and follow all other waste disposal procedures of the Chemical Hygiene Plan.

Do not discharge to the sewer malodorous or lachrymatory substances in large volumes, or any substances which might interfere with the biological activity of waste water treatment plants, create fire or explosion hazards, cause structural damage or obstruct flow.

(q) Working alone: Avoid working alone in a building; do not work alone in a laboratory if the procedures being conducted are hazardous.

2. Working with Allergens and Embryotoxins

(a) Allergens (examples: diazomethane, isocyanates, bichromates): Wear suitable gloves to prevent hand contact with allergens or substances of unknown allergenic activity.

(b) Embryotoxins (examples: organomercurials, lead compounds, formamide): If you are a woman of childbearing age, handle these substances only in a hood whose satisfactory performance has been confirmed,

using appropriate protective apparel (especially gloves) to prevent skin contact.

Review each use of these materials with the research supervisor and review continuing uses annually or whenever a procedural change is made.

Store these substances, properly labeled, in an adequately ventilated area in an unbreakable secondary container.

Notify supervisors of all incidents of exposure or spills; consult a qualified physician when appropriate.

II. CRITERIA FOR USE OF CONTROL MEASURES TO REDUCE EMPLOYEE EXPOSURE TO HAZARDOUS CHEMICALS

A. The following operations shall be performed in LABORATORY FUME HOODS: (Dispensing and dilution of formaldehyde, 2-mercaptoethanol, phenol, chloroform, and other volatile organic solvents.)

B. The following operations shall be performed in BIOLOGICAL SAFETY CABINETS: (Experiments involving live virus)

D. Respirators shall be used in accordance with the respiratory protection policy of The University of Montana. This policy and associated documentation is available for employee review from Environmental Health at 243-4503 or at: http://www.umt.edu/research/eh/occhealthsafety.htm

E. Appropriate protective apparel compatible with the required degree of protection for substances handled shall be used. Either the laboratory supervisor or the Chemical Hygiene Officer will advise employees on glove, gown, eye protection, barrier creams, etc. use.

F. Employees will be instructed on the location and use of eye wash stations and safety showers. The laboratory supervisor is responsible for this instruction.

III. MAINTENANCE OF FUME HOODS AND OTHER PROTECTIVE EQUIPMENT

A. FUME HOODS will be inspected every 6 months by Environmental Health staff; adequacy of face velocity will be determined by use of an ALNOR velometer; reports of hood inspections are filed in the Environmental Health and Risk Management Office for employee review.

B. SAFETY SHOWERS AND EYEWASH STATIONS will be inspected every 6 months by Environmental Health staff. A tag affixed to each shower and eyewash will have the last date of inspection recorded on it. It is the responsibility of the individual lab employees to keep the eyewash station clear and to run the eyewash each week to ensure water flow and quality.

IV. EMPLOYEE INFORMATION AND TRAINING

A. Each employee covered by the laboratory standard will be provided with information and training so that they are apprised of the hazards of chemicals present in their work area.

B. The training/information sessions shall include:

1. The contents of the OSHA Chemical Hygiene Standard (CFR1910.1450 and its appendices). These shall be available to employees as part of the laboratory safety manual.
2. The availability and location of the written chemical hygiene plan.
3. Information on OSHA permissible exposure limits (PELs) where they exist, and other recommended exposure limits.
4. Signs and symptoms associated with exposure to hazardous chemicals in laboratories.
5. Location of reference materials, including all MSDSs received, on the safe handling of chemicals in laboratories.
6. Methods to detect the presence or release of chemicals (ie. monitoring, odor thresholds, etc.).
7. The physical and health hazards of chemicals in laboratory work areas.
8. Measures to protect employees from these hazards, including:

    a. Standard operating procedures
    b. Work practices
    c. Emergency procedures
    d. Personal protective equipment
    e. Details of the chemical hygiene plan

C. TRAINING: Initial training on laboratory standard operating procedures and the location of the Chemical Hygiene Plan, material safety data sheets, and safety equipment will be done by the laboratory supervisor. Specifics about immediate chemical hazards in normal day to day operations will also be addressed before the employee's first potential exposure. An employee must take the online Chemical Safety Training Course found at: http://www.umt.edu/research/eh/ppt/LabSafety08.ppt

D. Each employee will sign a form (p. 11) documenting that they have received training. This form will be filed in the Lab Safety Manual and document that the employee has been trained on SOPs within the lab, the location of MSDS and immediate chemical hazards. An additional form will be filed in the Lab Safety Manual after the employee has completed the online course (a copy of the graded quiz is adequate). Note that a signed form does

not necessarily mean that person has understood and retained the training provided. An enforcement officer would determine training based on employee interviews, and employee knowledge.

E. The laboratory supervisor is responsible for developing standard operating procedures. The laboratory supervisor is responsible for the portion of the training on standard operating procedures, location of MSDS and immediate chemical hazards within the lab.

V. PRIOR APPROVAL FOR SPECIFIC LABORATORY OPERATIONS

Certain laboratory procedures which present a serious chemical hazard require prior approval by the laboratory supervisor before work can begin. For this facility, these procedures include: Dilution of acids and bases, DNA extractions using phenol:chloroform, preparing solutions of acrylimide and casting of gels, use of ethidium bromide for staining DNA in agarose gels.

(If you have procedures that require special authorization due to the hazardous nature of the materials used, describe the chemicals and procedures here. If the laboratory does not utilize these classes of chemicals then include a sentence which states "Our laboratory does not at this time use any chemicals which are sufficiently hazardous to require prior approval before they are used.)

VI. MEDICAL CONSULTATION AND EXAMINATION

The University of Montana shall provide, to affected employees, medical attention including follow-up examinations which the attending physician determines is necessary under the following circumstances:

A. Whenever an employee develops signs and symptoms associated with a hazardous chemical to which they have been exposed, the employee shall be provided with an opportunity to receive appropriate medical examination. The employee shall contact the work area supervisor or the Chemical Hygiene Officer to initiate the medical program.

B. Whenever an event takes place in the work area, such as a spill, leak, explosion, or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee, laboratory or custodial, shall be provided an opportunity for a medical consultation. This consultation is for the purpose of determining the need for a medical examination. The supervisor or work area supervisor should notify the Workers Compensation Program Manager at 243-2842 and the Environmental Health and Risk Management Office at 243-4503 about the circumstances of the accident that resulted in a reported exposure.

C. All medical examinations and consultations are provided for by Missoula area medical providers. Except in extreme cases, student employees should be referred first to the Student Health Service. All aspects of these examinations are provided by a licensed physician, or supervised by a licensed physician. These examinations are provided without cost to the employee, without loss of pay, and at a reasonable time and place.

D. The Chemical Hygiene Officer or work area supervisor will provide the following information to the physician:

1. Identity of the hazardous chemical to which the employee may have been exposed.
2. A description of the conditions of the exposure including exposure date if available.
3. A description of signs and symptoms of exposure that the employee is experiencing (if any).

E. The written opinion that UM receives from the physician shall include:

1. Recommendations for future medical follow-up.
2. Results of examination and associated tests.
3. Any medical condition revealed which may place the employee at increased risk as the result of a chemical exposure.
4. A statement that the employee has been informed by the physician of the results of the examination/consultation and told of any medical examination or treatment.

F. The material returned to The University of Montana by the physician shall not include specific findings and diagnosis which are unrelated to occupational exposure.

VII. RESPONSIBILITIES UNDER THE CHEMICAL HYGIENE PLAN

The Assistant Environmental Health Director is designated as the chemical hygiene officer for The University of Montana.

The Laboratory Supervisors shall have immediate control and responsibility for chemical safety within their laboratories.

VIII. ADDITIONAL PROTECTION FOR WORK WITH SELECT CARCINOGENS, REPRODUCTIVE TOXINS, AND CHEMICALS WITH HIGH ACUTE TOXICITY.

When any of these chemicals are used, the following provisions shall be employed where appropriate:

1. Establishment of a designated area.
2. Use of containment devices such as fume hoods or glove boxes.
3. Procedures for safe removal of contaminated waste.
4. Decontamination Procedures.

IX. EMERGENCY RESPONSE

Emergency response measures as required by the Environmental Protection Agency are detailed in The University of Montana Hazardous Materials Management Plan. A copy of this is available as a hard copy from Environmental Health at 243-4503 or at http://www.umt.edu/research/eh/hazplan6.doc on the web.

ADDITIONAL REFERENCES:

The University of Montana Environmental Health Home Page contains links to most campus health and safety policies---http://www.umt.edu/research/eh

Material Safety Data Sheets may be found at;

http://hazard.com/msds/

The full text of the OSHA standard "Occupational exposure to hazardous chemicals in laboratories" may be found at http://www.umt.edu/research/eh/1450.doc

Links to over 600 health and safety related web pages can be found at the CCOHS web site--
http://www.ccohs.ca/