

CHEMICAL HYGIENE PLAN

California Code of Regulations
Title 8, Chapter 4
Section 5191 *et seq.*

California State University, East Bay

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FOREWORD

On January 31, 1990, the Occupational Safety and Health Administration (OSHA) promulgated a final rule for occupational exposure to hazardous chemicals in laboratories. Included in the standard, which became effective on May 1, 1990, is a requirement for all employers covered by the standard to develop and carry out the provisions of a Chemical Hygiene Plan (CHP).

A CHP is defined as a written program which sets forth procedures, equipment, personal protective equipment and work practices that are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace. Components of the CHP must include standard operating procedures for safety and health, criteria for the implementation of control measures, measures to ensure proper operation of engineering controls, provisions for training and information dissemination, permitting requirements, provisions for medical consultation, designation of responsible personnel, and identification of particularly hazardous substances.

This plan is the Chemical Hygiene Plan developed for the College of Science at California State University, East Bay. This CHP is maintained and is readily available to laboratory employees in the College of Science Office and in each department handling chemicals. All laboratory personnel must know and follow the procedures outlined in this plan. All operations performed in the laboratory must be planned and executed in accordance with the enclosed procedures. In addition, each employee is expected to develop safe personal chemical hygiene habits aimed at the reduction of chemical exposures to themselves and coworkers.

This document was developed to comply with CCR Title 8, Chapter 4, Section 5191 *et seq.* This CHP will be reviewed, evaluated and updated at least annually, and is readily available to employees.

Danika LeDuc

Chief Hygiene Officer

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1. Standard Operating Procedures for Laboratory Chemicals

1.1. Chemical Procurement

- 1.2.9. Storage of chemicals at teaching lab bench or other work areas shall be limited to those amounts necessary for one operation or shift. The container size shall be the minimum convenient. The amounts of chemicals at the lab bench shall be as small as practical. Chemicals in the workplace shall not be exposed to sunlight or heat. In research labs, relevant chemicals can remain present and accessible for the duration of the research project.
- 1.2.10. Stored chemicals shall be examined at least annually by a department representative for replacement, deterioration, and container integrity. The inspection should determine whether any corrosion, deterioration, or damage has occurred to the container or the storage facility as a result of leaking chemicals.
- 1.2.11. Periodic inventories of chemicals in work and research areas shall be conducted by designated staff. Unneeded items shall be properly discarded or returned to the storage area.
- 1.2.12. Write the receipt date on all chemical containers. Chemicals with degradation properties, e.g. peroxide formers, shall also be labeled with an expiration or disposal date.

1.3.

- 1.3.4. Eating, drinking, smoking, chewing gum or application of cosmetics in areas where laboratory chemicals are present shall be avoided. These areas have been clearly identified. Hands shall be thoroughly washed prior to performing these activities.
- 1.3.5. Storage, handling and consumption of food or beverages shall not occur in locations where chemicals are present or stored, including refrigerators.

- 1.4.2. All glassware will be handled and stored with care to minimize breakage; all cracked or broken glassware will be immediately disposed of in the broken glass container.
- 1.4.3. When practical, all evacuated glass apparatuses shall be shielded to contain chemicals and glass fragments should implosion occur.
- 1.4.4. Labels shall be attached to all chemical containers, identifying the contents and related health and physical hazards.
- 1.4.5. Waste receptacles shall be identified and dated in accordance with laboratory waste collection and disposal practices.
- 1.4.6. Laboratory equipment shall be inspected on a periodic basis as specified in RSS and replaced or repaired as necessary.

1.5. Personal Protective Equipment

- 1.5.1. Safety glasses meeting ANSI Z87.1 are required for employees, students and visitors in the laboratory and will be worn at all times when handling hazardous chemicals. Contact lenses may be worn if recommendations in the NIOSH Current Intelligence Bulletin #59 are followed. Currently, OSHA recommends against contact lens use when working with acrylonitrile, methylene chloride (dichloromethane), 1,2-dibromo-3-chloropropane, ethylene oxide (oxirane), and 4,4'-methylenedianiline (MDA). These recommendations are presumably based on best professional judgment, as no specific bases are provided in the preambles to these standards.
- 1.5.2. Chemical goggles and/or a full-face shield shall be worn during chemical transfer and handling operations as prudence or procedures dictate.
- 1.5.3. When hazardous materials are being handled, sandals or perforated shoes are discouraged. Bare feet are prohibited. Safety shoes, per ANSI Z41.1, are required where employees lift or handle heavy objects.
- 1.5.4. Lab coats are provided for employees, and their use is required where procedures dictate or when recommended.

be skin contact with hazardous chemicals. Replace damaged or deteriorated gloves immediately. Remove gloves prior to exiting the lab to avoid contaminating common door knobs and faucets. Always wash hands after gloves are removed.

In special cases, specific gloves can be washed and reused. Wash the gloves prior to removal from the hands.

- 1.5.6. Thermal-resistant gloves shall be worn for operations involving the handling of heated or cryogenic materials. Thermal-resistant gloves shall be non-asbestos and shall be replaced when damaged or deteriorated.
- 1.5.7. Respirator usage shall comply with Cal OSHA Respiratory Protection Standard, Title 8 CCR 5144 and CSUEB Respiratory Protection Program. For information about this program, contact Environmental Health and Safety. This program requires a workplace evaluation, training, a medical exam, and respirator fitting prior to use and annually thereafter.

1.6. Personal Work Practices

- 1.6.1. Laboratory supervisor must ensure that each employee knows and follows the rules and procedures established in this plan.
- 1.6.2. All employees shall remain vigilant to unsafe practices and conditions in the laboratory and shall immediately report such practices and/or conditions to the laboratory supervisor. The supervisor must correct unsafe practices and or conditions promptly.
- 1.6.3. Long hair and loose-fitting clothing shall be confined close to the body to avoid catching fire or being caught in moving machine/equipment parts.
- 1.6.4. Utilize laboratory fume hoods to avoid contamination of laboratory atmosphere.
- 1.6.5. Avoid unnecessary exposure to all chemicals by any route.
- 1.6.6. Do not smell or taste any chemicals.
- 1.6.7. Encourage safe work practices in coworkers by setting the proper example. Horseplay is strictly forbidden.
- 1.6.8.

1.6.9. Use engineering controls in accordance with Section 3.0.

1.6.10. Appropriate protective equipment shall be worn as procedures dictate and when necessary to avoid exposure. Inspect personal protective equipment prior to use.

1.7. Labeling

1.7.1. All containers in the laboratory shall be labeled. This includes chemical containers and waste containers. Manufacturer's labels shall include contents, hazardous characteristics, and source. Lab-generated labels shall include the chemical name or code (for student unknowns) and the physical and/or chemical hazards. It is good practice to date chemical containers by (a) the date of use, (b) the date of receipt, (c) the date of purchase, (d) the date of expiration, (e) the date of disposal, (f) the date of storage, (g) the date of preparation, (h) the date of analysis, (i) the date of synthesis, (j) the date of purification, (k) the date of characterization, (l) the date of identification, (m) the date of confirmation, (n) the date of validation, (o) the date of verification, (p) the date of calibration, (q) the date of maintenance, (r) the date of inspection, (s) the date of repair, (t) the date of replacement, (u) the date of disposal, (v) the date of recycling, (w) the date of reuse, (x) the date of reuse, (y) the date of reuse, (z) the date of reuse.

2.1.3. Air sampling study results are maintained by EHS.

2.2. Housekeeping

2.2.1. Each laboratory worker is directly responsible for the cleanliness of his or her workspace and jointly responsible for common areas of the laboratory. Laboratory management shall insist on the maintenance of housekeeping standards.

2.2.2. The following procedures shall apply:

2.2.2.1. All spills on lab benches or floors shall be immediately cleaned and properly disposed of. Large spills will necessitate the implementation of Appendix C - Laboratory Emergency Response Plan.

2.2.2.2. Teaching lab benches shall be kept clear of equipment and chemicals except for items necessary for the work currently being performed.

2.2.2.3. Work area shall be cleaned at the end of each operation. The entire work area shall be left clean and hazard free at the end of the working day. Lights, hot plates, other utilities, and other equipment should be turned off at the end of the day.

2.2.2.4. All apparatuses shall be thoroughly cleaned and returned to storage upon completion of usage.

2.2.2.5. All floors, aisles, exits, fire-extinguishing equipment, eyewashes, showers, electrical disconnects and other emergency equipment shall remain unobstructed.

2.2.2.6. All labels shall face front.

2.2.2.7. Chemical containers shall be clean, properly labeled, and liquids will be stored in secondary containers. Chemicals will be returned to storage upon completion of usage.

2.2.2.8. All chemical wastes will be disposed of in accordance with approved laboratory waste collection and disposal practices.

2.3. Safety and Emergency Equipment

2.3.1. Emergency telephone numbers, i.e.. 9-1-1 have been posted.

2.3.2. Fire extinguishers are available throughout the Science Building.

representative shall verify that existing extinguishers and other emergency equipment are appropriate for such chemicals. Fire extinguishers must be inspected monthly. EHS inspects all fire extinguishers in hallways. Fire extinguishers in classrooms, laboratories, and offices are the department's responsibility. Contact EHS if you need training on how to properly inspect a fire extinguisher.

2.3.3. All employees who might be exposed to chemical splashes shall be

meter should not be in the red section. An inward flow of air can be confirmed by holding a piece of tissue paper at the face of the hood (or

3.3. Glove Boxes and Isolation Rooms

The need for a glove box or isolation room will be evaluated and determined when the Chemical Hygiene Permit is completed and evaluated.

3.4. Refrigerators, Freezers, Cold Rooms and Warm Rooms

- 3.4.1. Do not store any material which poses risk of fire or explosion upon system failure. Flammables must be stored in a laboratory safe refrigerator.
- 3.4.2. Freezers or refrigerators utilized in laboratories where chemicals are used or stored must be prominently labeled to indicate whether they are or are not suitable for storing flammable liquids. Class I flammable liquids are defined as "any liquid having a flashpoint below 100 degrees F and having a vapor pressure not exceeding 40 PSI absolute at 100 degrees F." Class One liquids are subdivided as follows:
 - X Class IA: Those liquids having a flash point below 73 degrees F and a boiling point at or below 100 degrees F.
 - X Class IB: Those liquids having a flash point below 73 degrees F and a boiling point above 100 degrees F.
 - X Class IC: Those liquids having a flash point at or above 73 degrees F and below 100 degrees F.
- 3.4.3. Standard refrigerators have electrical fans and motors that make them potential ignition sources for flammable vapors. Do not store flammable liquids in a refrigerator unless it is approved for such storage. Flammable liquid-approved refrigerators are designed with spark-reducing parts on the inside and/or outside to avoid accidental ignition. Lab Safe or explosion proof refrigerators will be labeled by the manufacturer that they are approved for the storage of flammable materials. The refrigerator should be labeled with the words "No food or drinks may be stored in this refrigerator" if not already done so by the manufacturer. Household refrigerators will require a red and white label on the refrigerator door which states: "WARNING: This

when at least two personnel are present in the laboratory. At no time shall a student or employee, while working alone in the laboratory, perform hazardous operations. The determination of hazardous operations shall be made by the laboratory supervisor. Under unusual conditions, crosschecks, periodic security guard checks, or other measures may be taken when permitted.

5.1.2.2. Working After Hours

Laboratory personnel are not allowed to work alone with hazardous materials/operations after hours in the lab. The definition of lab hours will be determined by the laboratory supervisor. To conduct hazardous operations after hours, at least two workers approved by the laboratory supervisor must be present.

5.1.2.3. Unattended Operations

When laboratory operations are performed which will be unattended by laboratory personnel (continuous operations, overnight reactions, etc.), the following procedures will be employed:

5.1.2.3.1. The permit system shall be utilized.

5.1.2.3.2. The laboratory supervisor will review work procedures to ensure for the safe completion of the operation.

5.1.2.3.3. If prudent and appropriate, a sign will be posted at the entrances to the laboratory.

5.1.2.3.4. Precautions shall be made for the interruption of utility service during the unattended operation (loss of water pressure, electricity, etc.).

5.1.2.3.5. The person responsible for the operation will return to the laboratory at the conclusion of the operation to assist in the dismantling and cleanup of the apparatus.

6. Medical Consultations and Examinations

6.1. An opportunity to receive medical attention is available to all employees and students who work with hazardous chemicals in the laboratory. The opportunity for medical attention will be made available to employees/students under the following circumstances:

- 6.1.1. Whenever an employee or student develops signs or symptoms associated with a hazardous chemical to which the employee or student may have been exposed in the laboratory.
 - 6.1.1.1. Employees should immediately report the condition to the Worker's Compensation Coordinator (WCC) if they think they are experiencing signs and symptoms of a chemical exposure. Provide the WCC copy of the chemical(s) MSDS(s).

7.3.7. Determine the proper level of personal protective equipment, ensure that such protective equipment is available and in working order,

7.3.8. Ensure that appro

