

MARIST COLLEGE

SCHOOL OF SCIENCE

CHEMICAL HYGIENE PLAN

REVISED September, 2008

(last reviewed April, 2009)

1. This plan is designed to meet the requirements of the OSHA Standard 1910.1450 for chemical safety and health in educational laboratories. The purpose of the plan is to eliminate exposures of hazardous chemicals to all who work or learn in the lab environment. This plan shall be reviewed annually.
2. This plan applies to all employees or students who handle hazardous chemicals as part of their duties or studies related to the School of Science program facilities and activities.
3. The Marist College Vice President of Business and Financial Affairs is responsible for the safety and welfare of all employees and students.
4. Chemical Hygiene Officer

Richard Carroll is designated as the Marist College Chemical Hygiene Officer/Consultant and will be responsible for the overall development and implementation of the Chemical Hygiene Plan, which includes the following responsibilities:

- A. Ensure that a written Chemical Hygiene Plan is in place for all chemical-using laboratories.
  - B. Coordinate with the faculty and staff of Marist College to implement the provisions of the Chemical Hygiene Plan.
  - C. To conduct periodic inspections and training sessions to address any actual or potential safety hazards in lab operations.
  - D. To monitor procurement, use and disposal of chemicals used in labs.
  - E. To constantly seeks ways to improve the Chemical Hygiene Plan.
  - F. To ensure that any monitoring or medical records necessary are kept in accordance with OSHA requirements.
5. Faculty Responsibilities - All School of Science faculty are responsible for the following:
    - A. School of Science faculty members who use chemicals are strongly urged to substitute alternative, less toxic chemicals or materials that pose less potential for exposure during use whenever possible. When purchasing hazardous or potentially hazardous substances, users

must order the smallest appropriate quantities in order to minimize the potential for exposure as well as the cost of hazardous waste disposal. Written permission from the Dean of the School of Science is required for any purchases.

- B. Ensuring that all experimentation or analyses conducted in the lab will not exceed permitted chemical exposures or pose any undue risk.
- C. Ensuring that all those working in the lab are aware of the general and specific safety rules of the lab including the location and proper operation of emergency equipment (i.e., emergency phones, eyewashes, showers, etc.).
- D. Ensuring that the proper personal protective equipment is used to limit exposure to any hazards present (i.e., eye protection, gloves, lab coats, etc.).
- E. Ensuring that the provisions of the Chemical Hygiene Plan are implemented in all lab operations.
- F. Complying with findings and recommendations resulting from regular chemical hygiene and housekeeping inspections, including an inspection of all safety equipment to ensure it is in working order.
- G. Knowing how to access the current legal requirements concerning regulated substances.
- H. Providing training for all laboratory workers and students in the use of any specialized safety equipment and hazards.
- I. Providing information and training to all students and lab employees to ensure that they are apprised of the hazards of chemicals present in their work area. This information and training is to be provided at the time of initial assignment to the lab work area and at any other time that a new exposure is present.

#### 6. Standard Operating Guidelines

- A. All incidents should be reported immediately to the Office of Safety and Security.
- B. Determine the hazards of all chemicals used from material safety data sheets (MSDS) or other pertinent references.
- C. Be aware of the proper storage practices of chemicals and ensure that incompatibles are stored separately.
- D. Be familiar with lab emergency procedures including spill cleanup, waste disposal, evacuation routes and activation of the emergency system.
- E. Always wear the protective equipment appropriate for the chemical being used.

***F. Never work alone when using hazardous chemicals.***

G. All beakers, flasks, vials or other containers with chemicals must be properly labeled with exact contents, generators initials and the date.

H. **Unattended Operations:** Avoid leaving hazardous experiments or operations unattended overnight or over the weekend, whenever possible. If you must leave a hazardous experiment unattended, then leave the lights on in the hood, minimize any potential problems, and place a descriptive sign near the experiment (e.g. on the hood). The sign must include the faculty member's name, home phone number, and a brief description of the experiment. Any unattended operation must utilize precautions for containment of toxic substances in the event of a utility failure (for example, water pressure change or electrical power outage) or foreseeable accident. For example, water hoses on condensers should be wired on to avoid a popped hose which could result in a laboratory flood or runaway reaction.

7. Protective Clothing For Hazardous Chemical Use

A. Clothing that minimizes skin exposure should be worn. This includes long sleeve shirts or blouses and long pants. Shoes should be worn; sandals and perforated shoes are not allowed.

B. Choose gloves that are compatible with the chemicals being used. Glove information can be found on the MSDS. Gloves should be inspected for integrity prior to use and during use. Always remove gloves before exiting the lab.

C. When working with hazardous chemicals, always wear appropriate eye protection. Goggles should form a tight seal around the eyes for protection against splashes.

D. For added protection against splashes wear a lab coat. Heavily contaminated protective clothing should not be worn.

8. Personal Hygiene

A. Be aware of the four routes of entry of chemicals: inhalation, ingestion, injection and skin/eye contact.

B. Immediately wash exposed skin if contact was made with any chemical. Make it a habit to wash thoroughly with soap after finishing work and leaving the laboratory.

C. Do not eat, drink, smoke or chew gum in the laboratory. Never store food in a lab refrigerator.

D. Never use your mouth for suctioning or pipetting. Always use a suction bulb.

E. Never check chemicals by sniffing or inhaling them directly.

- F. If anyone in the lab is splashed in their eyes with a chemical, ensure that they rinse in an eyewash for a minimum of fifteen (15) minutes and report the incident to Campus Security at x5555 immediately.
- G. Long hair should be tied back and wearing of loose fitting clothing should be avoided.

#### 9. Housekeeping

- A. Maintain clear aisles throughout the lab at all times. Do not store any materials or items in any exitway.
- B. Keeps all benches and work areas clear of clutter. Clean all work areas when work is finished.
- C. Always ensure that access to emergency equipment is maintained. Do not block fire extinguishers, alarm pull boxes, eyewashes, showers, spill kits and any other emergency equipment in the lab. Storage shall not be within 18 inches of sprinkler heads.
- D. All chemical spills should be cleaned up without delay. Ensure that the proper cleaning materials are available. (i.e., sorbant pads, neutralizer, disposal bags, etc.).
- E. Dispose of chemical waste on a regular basis in approved, properly labeled disposal containers.
- F. Ensure that all chemical containers are labeled to conform to the provisions of the OSHA Hazard Communication Standard (29CFR 1910.1200).

#### 10. Chemical Procurement and Storage

- A. Only order as needed and in appropriate amounts.
- B. No containers should be accepted in the lab unless they are properly labeled and have a material safety data sheet (MSDS) available.
- C. Room 113 in Donnelly Hall shall contain MSDS for all School of Science chemicals stored in the bunker and on the first floor of Donnelly Hall. Room 231 in Donnelly Hall shall contain MSDS for all School of Science chemicals stored in the bunker and on the second floor of Donnelly Hall. The bunker attached to Donnelly Hall shall contain MSDS for all School of Science chemicals stored in the bunker. A link to an on-line set of MSDS may be found at this page on the School of Science web site: ([www.marist.edu/science/msds/html](http://www.marist.edu/science/msds/html)).
- D. An inventory shall be taken at least annually of all lab use chemicals. During this inventory all containers should be inspected for integrity, all labels checked for legibility and chemicals checked for any deterioration or past expiration dates. Any containers found to be in unacceptable condition should be sent for disposal by a licensed waste hauler.
- E. Storage areas shall be identified with the types of hazard present.

- F. Keep chemical storage in the labs to a minimum.
- G. No donated chemicals shall be accepted into the School of Science.
- H. Gas cylinders must be secured to walls or benches.

#### 11. Employee and Student Awareness

- A. All lab workers and students will be informed as to the provisions of the OSHA Standards “Occupational Exposure to Hazardous Chemicals in Laboratories” (29 CFR 1910.1450 dated 5/1/1990)
- B. Copies of the Chemical Hygiene Plan should be available to all employees and students for their awareness.
- C. Employees and students must be aware of the permissible exposure limits (PEL) and thresholds limit values (TLV) of each chemical they use in order to prevent overexposure. This information is available in the material safety data sheets.
- D. Employees and students must be aware of the physical and health hazards of each hazardous chemical they use. No one may use a chemical without knowing this information.

#### 12. Waste Disposal

- A. All chemical waste should be disposed of in a period not exceeding 6 months. Chemical waste from experiments, analyses, etc., should be collected and stored apart from the normal chemical storage. Waste collection containers should be clearly marked with a label, which indicates the exact contents of the container (full chemical names, no abbreviations or formulas), the date that the container is full, the room number and the name of the person generating the waste. The waste should then be sent for disposal by a licensed waste hauler. Manifests must be kept of all chemical waste sent for disposal.
- B. All waste should be separated so that no incompatible chemicals are disposed of in the same container.

#### 13. Laboratory Hoods

- A. Lab hoods always should be kept closed and turned off when not in use.
- B. Storage in a hood should be discouraged. If any materials must be stored in a hood for a short term, they should not interfere with the hood operation (i.e., blocked exhaust or sash) and they must have continuous proper ventilation.

- C. All lab hoods should be inspected on a quarterly schedule to ensure proper face velocity and correct operation of the sash. In addition, the hood should be checked for storage of non-essential items and overall cleanliness.
- D. If any hood is found to be working at less than capacity or not working at all it should be placed out of service and affixed with a sign indicating it must not be used. Repairs should be arranged for and the lab supervisor advised of the condition of the hood.
- E. Hoods should be operated with the fan speed on high and the sash placed in the most optimal position, never fully open. Normal operation of the sash should be at the 100 to 125 linear feet/min. range. All materials kept in the hood should be at least four inches (4") away from the sash.

#### 14. Material Developed in the Lab

- A. If the composition of materials produced in the lab is known to be hazardous, then proper training must be offered to those handling the materials prior to use.
- B. If the material is extremely hazardous steps must be taken to ensure its safe handling.
- C. If the material is a mixture containing at least one known hazardous component, then the entire mixture should be considered hazardous.
- D. If an unknown by-product is produced, then it should be considered hazardous until proven otherwise.
- E. If the chemical substance is produced for another user, then the requirements of the Hazardous Communication Standard (CFR 19 1910. 1200) shall be effective and an MSDS for the material must be produced.
- F. All materials generated in the lab for exclusive lab use should be labeled with the identity of the material to allow reference to any available safety information.

#### 15. Extremely Hazardous Materials

##### A. Toxic Substances

- (1) Be aware that the primary routes of entry are inhalation, injection, skin contact and ingestion.
- (2) Written permission for use must be obtained from the Dean of the School of Science.
- (3) These substances must only be handled in a properly operating fume hood.
- (4) Appropriate protective apparel must be worn. Care should be taken to insure that the gloves selected are the proper type and are not compromised in any way.
- (5) Storage of these substances should be in a well ventilated, secure area, in an unbreakable container and clearly marked as to their hazard. (I.e., Danger-Possible Teratogen).

- (6) Wash hands frequently to avoid transmission to other surfaces.

#### B. Carcinogens

- (1) Primary routes of exposure are ingestion, inhalation, skin contact and injection.
- (2) Written permission for use must be obtained from Dean of the School of Science.
- (3) Carcinogens must only be used in designated areas which have special warning signs. (i.e., Danger-Cancer Hazard, Danger-Potential Cancer Hazard and Authorized Personnel Only).
- (4) Only handle carcinogens in a properly operating fume hood.
- (5) When finished, decontaminate all materials and equipment used. Thoroughly clean work area and remove protective apparel.
- (6) Thoroughly wash your hands and any other exposed skin surface.
- (7) All carcinogens must be stored in a secure, well-ventilated area and must be in non-breakable containers. All containers shall be labeled with the material name and the hazard it contains.

#### C. Peroxide formers

- (1) Diethyl ether, tetrahydrofuran, and other peroxide-forming chemicals must be labeled with the exact date opened and the person's initials who first opened the container.
- (2) Peroxide formers should be purchased in volumes that can be used up before the manufacturer's expiration date marked on the container.
- (3) Peroxide formers should not be used past their expiration date (or within one year of opening), and any container found past this date should be disposed of as hazardous waste.

### 16. Monitoring

- A. Initial monitoring of regulated chemicals should be performed as required by applicable standards if there is any reason to believe that the exposure levels of any substance routinely exceed the action level. (In the absence of an action level, the Permissible Exposure Limit [PEL].)
- B. If the material is not regulated, monitoring should be performed according to the toxicity of the material.
- C. An employee can be considered exposed to a chemical if any of the following occur:
  - (1) Monitoring devices indicate that levels exceed the Threshold Limit Value (TLV), Permissible Exposure Limit (PEL) or Short Term Exposure Limit (STEL) of the chemical monitored.
  - (2) Illness or symptoms can be attributed to chemicals in the lab.
  - (3) Release of a chemical in sufficient quantities can cause an exposure.

- D. Need for initial monitoring should be based on exposure limits, existence of adequate engineering controls, physical properties of the material, toxic properties of the material and the amount of material being used. The lab supervisor should evaluate each situation for the need to monitor.
- E. Periodic monitoring of regulated chemicals is required if initial monitoring shows employee/student exposure over the action level or Permissible Exposure Limit (PEL).
- F. Monitoring results shall be made available to employees/ students within fifteen (15) working days after the receipt of the results. This should be done in writing either individually or posted in an appropriate location accessible to all lab workers. A copy of the results should be kept in each employee/ student file at Human Resources.

17. Circumstances Requiring Prior Approval

- A. Prior approval by the Dean of the School of Science is necessary if any of the following apply:
  - (1) Quantities exceed what is considered laboratory scale.
  - (2) The material is extremely hazardous, such as a carcinogen or teratogen.
  - (3) An MSDS is not available.
- B. A record of the approval should be noted and kept by the Dean of the School of Science and the Office of Safety and Security.

18. Medical Consultation/ Examination

- A. A physical examination or medical consultation should be available for employees/students when:
  - (1) Any lab worker develops signs or symptoms of a chemical exposure.
  - (2) Routine monitoring reveals exposure.
  - (3) A spill, leak or any other unusual occurrence causes the probability of an exposure.
  - (4) Upon request if an exposure is suspected.
- B. All examinations and/or consultations will be performed under the direction of a licensed physician.
- C. The following information shall be provided to the physician:
  - (1) The identity and quantity of the chemical exposed to.
  - (2) An account of the incident that caused the exposure.
  - (3) Description of the signs or symptoms the worker is experiencing.
- D. The physician shall provide a written opinion which includes:

- (1) Recommendations for medical follow up.
- (2) The results of the examination and any additional tests.
- (3) Any medical condition revealed in the course of the examination, which places the worker in an increased risk position as a result of the exposure to the chemical.
- (4) A statement that the worker has been informed of the results of the examination or consultation and any medical condition found that might require additional treatment or examination.
- (5) The written opinion shall not reveal a specific finding or diagnoses of a condition unrelated to the occupational exposure.

19. Record Keeping

- A. A record shall be maintained by the School of Science for each lab worker of any measurements taken to monitor exposures. Records of the results of any medical examination or consultation that requires further treatment shall also be maintained by the School of Science.
- B. Monitoring and medical records must be kept, transferred and made available in accordance with OSHA and HIPAA requirements.