

Laboratory Safety Awareness Training – Hazard Recognition and Control

Why: To reduce the risk of injury and provide details on maintaining a safe laboratory environment.

Marian University Chemical Hygiene Plan – Marian Safety Online (MSO) Topic #4

Also online and smart phone accessible at <http://mdmusser318.wix.com/ehsmarianuniversity>

Environmental Health and Safety Specialist to provide training covering the following items:

4.3.1 An overview of the OSHA Laboratory Standard. Full text of the standard is available on the web at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10106

OSHA Standard: Requirements

1910.1450(e)(1) Where hazardous chemicals as defined by this standard are used in the workplace, the employer shall develop and carry out the provisions of a written Chemical Hygiene Plan which is:

1910.1450(e)(1)(i) Capable of protecting employees from health hazards associated with hazardous chemicals in that laboratory and

1910.1450(e)(1)(ii) Capable of keeping exposures below the limits specified in paragraph (c) of this section.

4.3.2 The content and availability of the Chemical Hygiene Plan and Laboratory Safety Resource.

Paper copies in S101 and digital version online @ Marian Safety Online (MSO) Topic #4

Section 1.1 Introduction and Purpose

The purpose of the Chemical Hygiene Plan is to set forth procedures, equipment, personal protective equipment and carefully planned work practices for the laboratory use of chemicals, which are capable of protecting laboratory workers from the potential health hazards of the chemicals they encounter in the workplace.

Section 2.0 Roles and Responsibilities

2.1 Environmental Health and Safety Specialist responsibilities

2.2 Professors/Laboratory Supervisors responsibilities

2.3 Laboratory Worker responsibilities

Section 3.0 Chemical and Hazard Identification

3.1 Manufactures Label

3.2 Safety Data Sheets

3.3 The 16 sections of a safety data sheet

3.4 Safety Data Sheet Pictograms

3.4.1 Globally harmonized system (GHS) Hazard Statements

3.4.2 Globally harmonized system (GHS) Precautionary Statements

Section 4.0 Components of the Chemical Hygiene Plan

Section 5.0 Chemical Procurement, Distribution, and Storage

Section 6.0 Safety Recommendations

The Laboratory Safety Resource contains:

1. *Emergency Chart – 2 sided flip chart*
2. *Generator Status Document*
3. *Ben Sadoff Science Building 1st and 2nd floor plans*
4. *Periodic table of the elements*
5. *Flinn Safety Faxes - Acid Safety; Biotechnology Safety; Flammable Liquid Safety*
6. *Safety Guidelines for Chemical Demonstrations*
7. *Fond du Lac Municipal Code 13.30 – Prohibited Discharges*
8. *Wisconsin Spill Reporting Guidelines – Condensed Version*
9. *Environmental Compliance Calendar Worksheet*
10. *Chemical Inventory*
11. *Flammable Cabinet Inventory*
12. *Globally Harmonized System (GHS) Hazard and Precautionary Statements*

4.3.3 The availability of safety data sheets (SDS's) and how to use them.

Available in Manual in Class room and on Marian Safety Online Topic #8 Safety Data Sheets, also provide Safety Data Sheet for Acetone.

4.3.4 An explanation of permissible exposure limits for chemicals.

Review Section 8 Exposure Controls/Personal Protection of the Safety Data Sheet

4.3.5 An overview of methods to recognize hazards, how to evaluate hazards, and common methods to prevent and control exposure.

1. *Know the properties of the chemicals you are working with, read the Safety Data Sheet, and review the hazard diamond and Hazard codes on the container you are using.*
2. *Use the smallest amount possible for experiment.*
3. *Use hood if flammable and if the substance has a Threshold Limit Value (TLV) of less than 50 ppm.*

4.3.6 The use, function and selection of personal protective equipment.

Eye protection: *goggles required when working with chemicals, heating glassware.*

Gloves: *chemical resistant Nitrile gloves are available.*

4.3.7 Emergency procedures for fire, injury, chemical exposure, and chemical spill situations.

Fire prevention and response:

Bunsen burners (Instructors demonstrations), use hotplates if possible, to heat liquids.

In case of fire:

Turn off heat source; pour clay from spill control container over material.

If there is a fire alarm during class, turn off equipment, like hot plates, or Bunsen burners, and calmly proceed to the nearest exit.

Injuries: Report all injuries to your Professor.

Eyewash/drench hose: location and use. If you are wearing your goggles this shouldn't have to be used for washing out your eyes.

Chemical Exposure: Some strong acids will cause irreversible damage to eye tissue on contact. No second chances. For example: Sulfuric acid.

Chemical Hygiene Plan section - 4.0.2 Accidents, exposure emergencies, and spills:

a. Inhalation: Move person to fresh air. If not breathing give artificial respiration. Obtain medical attention.

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

c. Eye Contact: Immediately flush the eyes for at least 15 minutes, holding eyes open. Obtain medical attention.

d. Ingestion: Encourage the victim to drink large amounts of water. Do Not Induce Vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water, obtain medical attention.

Chemical spill: clean up small spills with paper towel – under 100 ml.
Inform professor of any stock material spill.

Mercury Spill (Rare occurrence – mercury thermometers removed from use on 4.21.2015)

Notify the professor immediately! - Block off access to area, follow special cleanup procedures located in the Mercury Spill Control Kit, and also contact the EHS Specialist – Mark Musser.

For larger spills: (Rare occurrence) – Notify the professor immediately! Pour absorbent material from Spill Control Container located in each fume hood.

4.3.8 Chemical waste disposal procedures at Marian University.

Chemical waste management:

Proper disposal - capture all flammable, toxic, or corrosive wastes. The Professor will give special instructions before performing experiment.

The most common method will be to pour wastes into a labeled beaker on a work bench or in the hood if flammable. Beaker contents can also be poured into an empty waste container bottle. Please fill out a tag with the name the waste material.

Large quantities of bases or acids will be collected in a 5 gallon pail in the fume hood.

Special Note: Wastes that are a biohazard must be autoclaved before disposal.

Each laboratory worker must be made aware of the following information:

4.3.2.1 Location of the Chemical Hygiene Plan:

The Chemical Hygiene Plan for the Biology and Science Departments is kept in Mark Musser's office (room S207c), in the individual laboratories, and on the Marian Safety Online resource – Topic #4 Chemical Hygiene Plan.

4.3.2.2 Nature and potential health and safety risks of specific hazardous substances used by the laboratory worker.

Each Principal Investigator ensures that each individual working in his or her laboratory understands the hazards of and how to properly handle the materials in the laboratory. The PI maintains relevant files in the laboratory.

- 1. Using apparatus to support glassware:** Use a study base to support the size glassware and clamps used during the experiment. Do not over tighten clamps; you want a snug, firm, fit.
- 2. Electrical safety:** cord management, use hot plate example. (Electrical short burn marks) To protect cords from damage, wrap cord around electrical outlet to keep cord away from edge of hot plate. Use hood for flammable chemicals.
- 3. Inspection of glassware before using:** Pass around cracked beaker, and test tube. Always check glassware for hairline cracks, star cracks on bottom of test tubes.
- 4. Cleaning glassware:** After dumping out waste into the labeled waste container, triple rinse glassware, the second and final rinse should be with distilled water. Place in drying rack.
- 5. Clean up scales** if you missed your weigh boat: Please use a damp paper towel to clean scale and countertop.

6. **Broken glassware disposal:** get a sample from container; always use a barrier device, small dust broom, or damp doubled paper towel. Place into broken glass storage container.
7. **If you need assistance or have any questions** about the experiment or procedures please ask.

4.3.2.3 Proper handling, under all circumstances, of hazardous substances used in the laboratory.

Chemical Usage:

We will be using the smallest quantity containers possible to conduct our experiments. To reduce the risk of spills and chemical releases to the classroom. The most common size will be 30 ml Nalgene dropper bottles.

Fume Hood Use: Place chemicals and apparatus at least 6 inches back from the sash, this will prevent spilled material from getting on the sash plate, prevents possible clothing exposure.

Close containers after each use, to prevent possible overexposure.

Chemical spill: clean up small spills with paper towel - under 100 ml.
Inform professor of any stock material spill.

For larger spills (Rare) Pour absorbent material from Spill Control Container located in each fume hood.

4.3.2.4 Location and availability of reference materials, including safety data sheets (SDSs) for hazardous chemicals used or stored in the laboratory.

Aldrich – Handbook of fine chemicals – Located in each laboratory

Safety Data Sheets are located in the individual laboratories, and on the Marian Safety Online resource – Topic #8 Safety Data Sheets.

Hazard Communication Standard Pictogram

As of June 1, 2015, the Hazard Communication Standard (HCS) will require pictograms on labels to alert users of the chemical hazards to which they may be exposed. Each pictogram consists of a symbol on a white background framed within a red border and represents a distinct hazard(s). The pictogram on the label is determined by the chemical hazard classification.

HCS Pictograms and Hazards

Health Hazard  ▪ Carcinogen ▪ Mutagenicity ▪ Reproductive Toxicity ▪ Respiratory Sensitizer ▪ Target Organ Toxicity ▪ Aspiration Toxicity	Flame  ▪ Flammables ▪ Pyrophorics ▪ Self-Heating ▪ Emits Flammable Gas ▪ Self-Reactives ▪ Organic Peroxides	Exclamation Mark  ▪ Irritant (skin and eye) ▪ Skin Sensitizer ▪ Acute Toxicity ▪ Narcotic Effects ▪ Respiratory Tract Irritant ▪ Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  ▪ Gases Under Pressure	Corrosion  ▪ Skin Corrosion/Burns ▪ Eye Damage ▪ Corrosive to Metals	Exploding Bomb  ▪ Explosives ▪ Self-Reactives ▪ Organic Peroxides
Flame Over Circle  ▪ Oxidizers	Environment (Non-Mandatory)  ▪ Aquatic Toxicity	Skull and Crossbones  ▪ Acute Toxicity (fatal or toxic)

Are there any questions?