

## 11.0 CHEMICAL HYGIENE PLAN

### 11.1 General Information

*Note: The information written in this section refers to OSHA 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories. For more information on this OSHA standard, consult:*

*[http://www.osha-slc.gov/OshStd\\_data/1910\\_1450.html](http://www.osha-slc.gov/OshStd_data/1910_1450.html)*

The university maintains many teaching and research scientific laboratories throughout the campus. Many of these laboratories are supported by the use of chemicals and hazardous materials. In order to ensure a safe working environment for the employees and students who work and learn in these facilities, it is necessary for the university to implement a Chemical Hygiene Plan. Additional information regarding the safe use of scientific laboratories can be found in section 10 of the EH&S policy.

A Chemical Hygiene Plan (CHP) is a written program with procedures that are designed to protect persons from the health hazards presented by chemicals used in the workplace. The procedures in this plan apply to all employees and students and/or the facilities associated with them in which *any* of the following apply:

- Chemical manipulations are carried out as “laboratory scale”. That is, they are working with substances and containers used for reactions, transfers, and other handling purposes.
- Multiple chemical procedures are used.
- Procedures involved are not part of a production process (facility is not manufacturing chemicals).
- Protective laboratory practices and equipment are available and in use to minimize the potential for exposure to hazardous substances.

The EH&S office is responsible for providing guidance for these and other procedures as they pertain to chemical hygiene. The University department responsible for the chemicals shall also ensure that employees and students are being trained to recognize and protect themselves from the hazards associated with the use of chemicals. The EH & S office shall maintain all records associated with the CHP including Manufacturers Safety Data Sheets (MSDS – see section 11.3).

Departmental Safety Coordinators shall be responsible for performing annual hazardous material inventories in accordance with the SARA Right to Know regulations. The DSC shall also coordinate hazardous material disposal procedures as outlined in section 11.25. In some cases, it may be necessary to appoint someone other than the DSC to handle matters as they relate to the CHP.

University faculty and staff are responsible for:

- Educating themselves on the CHP and its hazards as they pertain to their respective areas.
- Providing written operating procedures to students and other employees for specific laboratory and other HAZMAT related tasks.
- Providing appropriate personal protective equipment to personnel and students and require its use.
- Ensuring that all HAZMAT is properly contained, storage, and disposed of (if applicable) within their respective areas.
- Maintaining and understanding the MSDS sheets for all of the chemicals within their respective areas.

All university personnel and students are responsible for:

- Following all safety and health standards and rules.
- Reporting any hazardous condition to a supervisor, DSC, and/or the EH&S office.
- Wearing the proper personal protective equipment when working with hazardous materials.

University personnel and students may not operate equipment or use hazardous materials without understanding the hazards associated with it. All persons should ask a supervisor for help when in doubt about any procedures.

## **11.2 Procedures for HAZMAT**

### **11.21 Chemical Procurement**

*Note: Employees purchasing hazardous materials must do so in conformance with the University's Procurement Standards and Procedures Manual, found here:*

<http://purchasing.louisiana.edu/sites/purchasing/files/ULL%20Standards%20and%20Procedures%209-12-2013.pdf>

*Section 35 of this document pertains to the procurement of hazardous materials.*

- Ordering chemicals is the responsibility of the University department.

- Chemicals may not be ordered unless there is adequate personal protective equipment to handle it upon delivery.
- Chemicals may not be ordered unless there is an adequate storage facility within the department for that hazardous material.
- The Facility Management Central Receiving Depot is in charge of taking delivery of all university shipments including chemicals. Employees at the Central Receiving Depot are regularly trained on the proper shipment and receiving of packages containing hazardous materials.
- The Central Receiving Depot shall refuse any chemical shipment that is not properly packaged in accordance with 49CFR173 and 49CFR177. This includes, but is not limited to, the following:
  - ✓ The package must identify that it contains HAZMAT on the outside of the package.
  - ✓ The package must be properly labeled with an appropriate DOT label indicating the flammability, reactivity, and health rating of the chemical.
  - ✓ The package must be intact. No chemical container within the package may be exposed or open.
  - ✓ The package must contain a MSDS for each chemical included within the package. This copy shall be provided to the department for update its records.
- All chemical shipments shall be delivered to the university department in their original shipping package.
- University departments may not purchase quantities of chemicals that exceed what they can use prior to the expiration date or shelf life of the chemical.

### **11.22 Chemical Storage**

- Chemical from the Central Receiving Depot shall be immediately moved to their designated storage areas.
- In moving these chemicals, they shall be kept in their original shipping package until they are placed into their permanent storage facility (laboratory cabinet or applicable).
- Storage areas for chemicals shall be well illuminated to provide easier identification.

- Large bottles or containers of chemicals weighing more than 5 pounds should not be stored more than two feet from the ground.
- Chemicals shall be stored according to their hazard classification and compatibility.
- Whenever possible, acids should be stored in a separate cabinet from other chemicals.
- Bases, especially strong bases, should be stored in glass containers with a plastic or Teflon lid to avoid glass fusion.
- Light-sensitive chemicals should be stored in amber glass bottles to minimize the infiltration of ultraviolet light.
- Do not store liquid chemicals next to dry chemicals. Keep dry chemicals in a dry area to avoid moisture introduced reactions.
- Periodic inspection of chemicals in storage shall be included in the quarterly building inspections performed by the DSC (see section 3 and BSI-9-00 form, section 4).
- Cabinets that store flammable materials and chemicals:
  - ✓ Shall be made of metal no smaller (thinner) than 18 gauge.
  - ✓ Shall contain a sticker or permanent marking on the outside of the cabinet indicating that the contents within are flammable.
  - ✓ Shall contain a vent for allowing fumes to escape.
  - ✓ Shall not contain any paper or cardboard packaging or paperwork.

### **11.23 Chemical Handling and Safe Working Practices**

*Note: Additional laboratory safety information can be found in section 10*

- Smoking is not permitted in any area where chemicals are stored.
- University employees and students shall develop procedures such that the handling of and exposure to chemicals is kept to a minimum.
- When chemicals are brought from their storage area to a laboratory or other workspace, they shall be handled with care.
- If necessary, use a bucket or similar device to provide a protective barrier when transporting chemicals throughout the workspace.

- Do not transport or move chemicals that are not properly contained including a secure lid.
- Skin contact with any chemicals shall be avoided at all times.
- Use all personal protective equipment when handling chemicals (see section 9.21)
- All employees and students shall wash their hands and any other exposed skin with soap and water prior to leaving the laboratory or other chemical use area.
- Glassware and laboratory equipment or supplies shall not be used for food or drink consumption or preparation.
- Treat all unknown chemicals as though they are toxic and dangerous.

## **11.24 Chemical Identification and Labeling**

### **Identification**

Chemicals may be identified using the following information.

**Carcinogen:** A substance that is known or suspected to cause cancer in animals or humans that ingest it, breathe it, inhale it, or otherwise come into contact with it.

**Reproductive Toxins:** Chemicals that are known or suspected to cause mutations, birth defects, or other reproductive deficiencies in animals or humans.

**Acute Toxicity Chemicals:** Any chemical for which the LD50 data described in the applicable MSDS causes the substance to be classified as a level 3 or 4 health hazard according to the HMIS system.

### **Chemical Labeling**

- Primary chemical containers shall be appropriately marked with a durable and informative label.
- Primary chemical container labels shall identify the chemical's source and any indication of hazard due to exposure.
- Secondary chemical containers shall be labeled by the individual using the container.
- Existing labels on chemicals shall not be removed or defaced unless another appropriate label is immediately attached.

## **11.25 Hazardous Material Disposal**

- Check to ensure that the material you are disposing is indeed hazardous. Contact the EH&S Office if you are not sure. Examples of these include:
  - ✓ **Ignitable** – Class I and II flammable liquids, solids that are capable of causing fire, flammable compressed gases, and oxidizers.
  - ✓ **Corrosives** – Aqueous solutions that have a PH  $\leq 2$  or  $\geq 12.5$  (strong acids and bases). Also, liquids capable of corroding mild steel at a rate  $> 6.35$  mm/year at 55 degrees C.
  - ✓ **Reactive Substances**: Substances that react violently; produce toxic gases, or explosive mixtures when mixed with water.
  
- Properly label waste containers with the words “hazardous waste”, the exact contents of the bottle including percentages, and the start accumulation date of the container, if applicable.
- Keep waste in proper containers at all times.
- Keep waste container closed at all times.
- The departments that generate the waste shall inventory hazardous waste regularly. Hazardous waste of any kind may not be stored more than 270 days, per RCRA regulations.
- Hazardous material waste pickups shall be coordinated by the EH&S office.
- Documentation associated with all waste pickups will be maintained by the EH&S office including manifests and Certificates of Final Disposal (CD).
- To arrange for waste pickup, departments shall complete an HWD-11-00 form and mail this document to the EH&S office. This form can be obtained from the EH&S office at 482-5357 or via the EH&S website at <http://www.safety.louisiana.edu>. A blank copy of the HWD-11-00 form is also included on the next page of this section.



### **11.3 Record Keeping for Hazardous Materials: MSDS**

A Manufacturers Safety Data Sheet (MSDS) is a document that contains information about a chemical or hazardous substance including its manufacturer, emergency information, and all hazards associated with exposure to the chemical. MSDS sheets can also be downloaded from [www.sigmaaldrich.com](http://www.sigmaaldrich.com).

- The EH&S office shall maintain a collection of MSDS sheets from chemicals used on campus.
- Employees and students who use chemicals should understand how to read MSDS sheets.
- MSDS sheets for all chemicals within a department should be organized alphabetically in a binder with all emergency phone numbers located on its cover.
- All employees should know where the MSDS binder is located.
- Never store the MSDS binder near a chemical or flammable storage cabinet. Should chemicals begin reacting in the cabinet, it is dangerous to approach these chemicals to retrieve the MSDS sheet.

The following is a guide for understanding how to read MSDS sheets

#### **Section 1: Identification**

- List the identification of the chemical including any trade names.
- List the manufacturer of the chemical along with emergency contact information.
- List the health hazard rating, the fire rating, the reactivity rating, and any special ratings according to the DOT shipping labeling system.
- List all shipping information and regulations applicable to its transport.

#### **Section 2: Hazardous Ingredients**

- List the hazardous components of the chemical along with its CAS no.
- List the percentage or composition of each hazardous ingredient within the chemical.
- List the PEL (Permissible Exposure Limit) or TLV (Threshold Limit Values) of each hazardous ingredient within a chemical.

#### **Section 3: Supplier Notification**

- List any toxic ingredients required to disclose under section 313 of the Emergency Planning and Community Right-to-know Act of 1986 and the Federal Code of Regulations 40 CFR 372.
- Including in this listing is the CAS no., and its percentage weight by volume.



#### **Section 4: Physical and Chemical Characteristics**

Lists chemical characteristics such as:

- Boiling point. Temperature at which a liquid turns into a vapor
- Vapor pressure. The pressure exerted by saturated vapor above its own liquid in a closed container.
- Vapor density. The weight of the vapor compared to an equal volume of air.
- Specific gravity. The weight of a solid or liquid compared to an equal volume of water.
- Solubility in Water. The rate at which a substance will dissolve in water at ambient temperatures.
- Appearance and Color of the chemical.

#### **Section 5: Fire and Explosion Hazard Data**

- List the flash point of the chemical.
- List any flammable limits of the chemical including any explosive hazards.
- List the method of extinguishing fires caused or fueled by the chemical including any special instructions.

#### **Section 6: Reactivity Data**

- List the chemical as stable or unstable.
- List any conditions to avoid including any incompatibility with other chemicals.

#### **Section 7: Health Hazards**

- Identifies any routes of entry normally associated with the use of this chemical including inhalation, skin absorption, and ingestion.
- Further describes the health hazards, acute and chronic, associated with this chemical.
- Discloses any carcinogenicity with the chemical.
- Describes any signs and symptoms of exposure for each route of entry.
- Gives emergency procedures for each route of entry.

#### **Section 8: Precautions for Safe Handling and Use**

- Identifies any steps to be taken in case the chemical is spilled or released.
- List any special disposal methods for the chemical.
- List precautions to be taken when handling and storing the chemical.
- List other special precautions including any legal regulations that may be applicable.

#### **Section 9: Control Measures**

Lists any personal protective equipment required for the safe handling of the chemical.  
List any ventilation requirement for environments that the chemical shall be used in.

**Sections 10 and higher: Other information**

Not all MSDS sheets contain more information than is described in sections 1 – 9. However, some MSDS sheets will reveal laboratory test data from animals that relates to the toxicity of the chemical. Additionally, some MSDS sheets will give special ecological information, disposal considerations, transport information, and regulatory information in sections 10 and higher.