

1. PROGRAM STATEMENT

The University of North Alabama's (UNA) Chemical Hygiene Plan (CHP) is a written program

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correct thickness to allow reasonable dexterity while also ensuring adequate barrier protection.

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- When inserting glass tubing into stoppers or corks and placing rubber tubing on glass hose connections:
 - use adequate hand protection
 - lubricate tubing
 - fire-polish ends of glass tubing
 - hold hands close together to limit movement of glass should a fracture occur
 - when possible, substitute plastic or metal connections for glass to decrease the risk of injury
 - when handling broken glass wear hand protection

I. Use of Gas Cylinders

- Valve damage due to overpressure or mechanical failure (as when a cylinder falls or drops) may result in catastrophic consequences. To avoid these accidents, cylinders will:
 - be restrained in an upright position using non-combustible straps, chains or a suitable stand
 - not be stored in hallways
 - be stored in well-ventilated areas, protected against extreme weather conditions, and not reach temperatures higher than 125°F:
 - Be prevented/protected from contact with sparks, flames, and electrical hazards
- Combustible and oxidizing gases will be stored in separated locations.
 - Separation can be achieved by distance (at least 20 feet apart) or barriers (five-foot high, half-hour fire resistant wall).
- Only regulators approved for the specific gas at hand will be used. Oxygen-compatible threading compounds such as Teflon tape will be used when handling oxidizing gases.
- Oil, grease, or other lubricants will not be used on valves or fittings.
- When opening cylinder valves, the discharge direction will be away from the employee.
- When cylinders are not in use, the valve will remain closed and pressure relieved, and the protective cap in place.
- Cylinders will be moved with a help of a cart or hand truck. During transportation, the cylinder will be secured to the cart and with the cap in place.
- Cylinders will not be lifted by the cap.
- Wrenches will not be used on valves equipped with a hand wheel.
- If a cylinder develops a small valve leak, or a leak occurs in any safety device, it will be carefully removed out-of-doors or to an exhausted cabinet, away from any possible ignition source.

m. **Use of Refrigerators**

- Do not store food or beverages intended for human consumption in laboratory refrigerators.
- Refrigerators used to store flammable materials must be designed for flammable storage, explosion proof and approved for Class 1, Division I locations as described in Article 501 of the National Electrical Safety Code (NFPA No. 70 and NFPA No. 45).
 - These refrigerators should be labeled with the following legend:
"Acceptable for Storage of Flammable Materials."
- Laboratory refrigerators should be:
 - placed against fire resistant walls
 - equipped with heavy-duty cords
 - protected by a separate circuit breaker.
- Accumulation of vapors inside refrigerators will be prevented by:
 - Placing inside only closed containers
 - Using vapor tight seals

n. **Use of Heating Devices**

- Electrical devices that supply heat for reactions and separations are common in laboratories. Improper use of these devices can result in electrical hazards, fire hazards, and burns.
- Baths that need to be hot at the start of the shift should be equipped with timers.
- Flammable and combustible solvents in heated baths will be maintained in fume hoods.
- Inspect the unit before use to assure that it has automatic shutoff to prevent overheating, is in good working condition, and has been maintained according to manufacturer recommendations.

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- Gloves selection shall be based on chemical and physical resistance properties. Selected gloves shall be worn at all times when there may be a potential for chemical skin contact. Re-usable gloves shall be inspected prior usage. Damaged gloves shall be discarded. Gloves shall be washed prior removal from the hands.
- Chemically resistant aprons and gloves shall be worn when there is a potential for chemical splashes and projections.
- Thermal resistant gloves shall be worn when handling hot materials or conducting exothermic reactions. Cryogenic gloves are recommended when handling liquid nitrogen and similar cold materials.
- If environmental conditions require the use of respirators, selection and use shall comply with the respiratory protection program.

q. **Safe Work Practices**

- Procedures established in this CHP must be known and followed.
- Unsafe practices and conditions observed in the laboratory must be reported to the laboratory supervisor or Department Chairperson.
- Avoid unnecessary exposure to chemicals by any route by using personal protective equipment and engineering controls.
- Horseplay is forbidden.
- Safety and health protection shall be considered when planning new projects.

r. **Labeling**

- All containers shall be labeled.
- The existing label on a container entering the workplace from a supplier must not be removed, altered or defaced.
- The identity of the chemical and appropriate hazard warnings must be shown on the label. Chemicals in containers other than the original shall include identity of the chemical and appropriate hazard warnings.
- When a new container is received, the acquisition date will be placed on the label. If the material has a short shelf life, the recommended disposal date shall be written on the label. The Department owning the chemical shall develop a method to ensure it is used or compliantly discarded in advance of the expiration date.
- Hazardous Waste containers will be labeled per the requirements of EHS Manual Chapter 7, Hazardous

- i. Any recommendations for further medical follow-up.
- ii. Results of the medical examination and diagnostic tests.
- iii. Any medical condition revealed in the course of the examination that can place the person at increased risk of a result of exposure to chemicals.
- iv. A statement that the employee has been informed by the physician of the results of the consultation or medical examination.

14. CHEMICAL HYGIENE PLAN PERIODIC REVIEW

- a.

ATTACHMENT 1 - DEFINITIONS

Action Level means a concentration designated in 29 CFR part 1910 for a specific substance, calculated as an eight (8)-hour time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.

Carcinogen (see *select carcinogen*).

Chemical Hygiene Officer means an employee who is designated by the employer, and who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan. This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure.

Chemical Hygiene Plan means a written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment and work practices that (i) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace.

Emergency means any occurrence such as, but not limited to, equipment failure, rupture of containers or failure of control equipment which results in an uncontrolled release of a hazardous chemical into the workplace.

Employee means an individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

Hazardous chemical means any chemical which is classified as health hazard or simple asphyxiant in accordance with the Hazard Communication Standard (§1910.1200).

Health hazard means a chemical that is classified as posing one of the following hazardous effects: Acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); aspiration hazard. The criteria for determining whether a chemical is classified as a health hazard are detailed in appendix A of the Hazard Communication Standard (§1910.1200) and §1910.1200(c) (definition of "simple asphyxiant").

Laboratory means a facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

Communication Standard (§1910.1200) and §1910.1200(c) (definitions of "combustible dust" and "pyrophoric gas").

Protective laboratory practices and equipment means those laboratory procedures, practices and equipment accepted by laboratory health and safety experts as effective, or that the employer can show to be effective, in minimizing the potential for employee exposure to hazardous chemicals.

Reproductive toxins mean chemicals that affect the reproductive capabilities including adverse effects on sexual function and fertility in adult males and females, as well as adverse effects on the development of the offspring. Chemicals classified as reproductive toxins in accordance with the Hazard Communication Standard (§1910.1200) shall be considered reproductive toxins for purposes of this section.

Select carcinogen means any substance which meets one of the following criteria:

- (i) It is regulated by OSHA as a carcinogen; or
- (ii) It is listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or
- (iii) It is listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on Cancer Monographs (IARC) (latest editions); or
- (iv) It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:
 - (A) After inhalation exposure of 67 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m³;
 - (B) After repeated skin application of less than 300 (mg/kg of body weight) per week; or
 - (C) After oral dosages of less than 50 mg/kg of body weight per day.

ATTACHMENT 4 - STANDARD OPERATING PROCEDURE (SOP) TEMPLATE

Standard Operating Procedures (SOP) are written safety and health guidelines for laboratory work with hazardous chemicals and are required as a part of a laboratory-specific Chemical Hygiene Plan. Standard Operating Procedures can be written in one or more of the following ways:

1. By process (e.g. distillation, peptide synthesis, or glove box use).
2. By hazardous chemical (e.g. benzene, perchloric acid, chloroform).
3. By class of hazardous chemicals (e.g. organic solvents or peroxidizable chemicals).

INSTRUCTIONS: When an SOP is required and does not exist, fill out the form (complete all sections), print, and place in your Chemical Hygiene Plan. Train all affected lab personnel before proceeding.

Date:
Principal Investigator Name:
Process description:
<p>1. Hazardous Chemicals/Class of Hazardous Chemicals</p> <p><i>Define the hazardous chemicals/class of hazardous chemicals to be used.</i></p>
<p>2. Personal Protective Equipment (PPE) See <u>Section 8 of the UNA Chemical Hygiene Plan for assistance.</u></p> <p><i>Enter the PPE you plan to use here.</i></p>
<p>3. Engineering/Ventilation Controls Guidance: Describe engineering controls designed to reduce employee exposures to hazardous chemicals, such as fume hoods, snorkels, glove boxes, or safety features on equipment. In general, hazardous materials/processes should be used in a properly functioning chemical fume hood.</p> <p>For further information see in Section 8 of the Chemical Hygiene Plan</p> <p><i>Enter the engineering controls you plan to use here.</i></p>

ATTACHMENT 4 -

ATTACHMENT 5 – MANAGEMENT OF PEROXIDE FORMING CHEMICALS

APPENDIX 6 - INCOMPATIBLE CHEMICALS, continued

CHEMICAL

ATTACHMENT 7 - EMERGENCY EQUIPMENT

Fire Extinguishers are located in the hallways. Most are the **ABC** variety (for flammable liquids/paper & wood/electrical, but *not* for flammable metals).

UNA coordinates hands-on extinguisher training periodically and you are encouraged to attend this training. Chapter 3 of the Environmental Health and Safety Manual defines the university's