Standard Operating Procedure:
Cal/OSHA Particularly Hazardous Substances
Acute Toxins, Reproductive Toxins, Select Carcinogens

This document describes the baseline requirements necessary for safe storage, use, handling and disposal of chemicals that have been designated as "particularly hazardous" by Cal/OSHA.

Careful handling and stringent controls of these chemicals are essential in order to protect workers and the environment from contamination and to comply with Title 8 of the California Code of Regulations, Section 5209.

Additional requirements may apply, depending on the specific chemical. Examples include carcinogens that are also highly flammable and/or reactive. Contact EH&S to see if the chemical you plan to use requires further controls.

1. Defining Particularly Hazardous Chemicals:

Particularly Hazardous Chemicals fall into three major categories: reproductive toxins, acute toxins, and select carcinogens.

Reproductive Toxins are chemicals that affect the reproductive capabilities including causing chromosomal damage (mutations) and adverse effects on fetal development (teratogenesis). A list of reproductive toxins is maintained at:

http://www.oehha.ca.gov/prop65/prop65_list/Newlist.html#files

Appendix A contains a list of reproductive toxins.

Acute Toxins are chemicals that pose a high level of immediate health risk to individuals. They can be defined as:

1. A chemical with a median lethal dose (LD50) of 50 mg or less per Kg of body weight when administered orally to albino rats weighing between 200 and 300 gm each.
2. A chemical with a median lethal dose (LD50) of 200 mg or less per Kg of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 Kg each.
3. A chemical that has a median lethal concentration (LC50) in air of 5000 ppm by volume or less of gas or vapor, or 50 mg per liter or less of mist, fume, or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 gm each.

Appendix B contains a list of acute toxins.

Select Carcinogens are a category of chemicals where the available evidence strongly indicates that the substances cause human carcinogenicity.

A "select carcinogen" meets one of the following criteria.

1. It is regulated by Cal/OSHA as a carcinogen.
2. It is listed under the category "known to be carcinogens" in the annual report by the National Toxicology Program (NTP).

3. It is listed under Group 1 – “carcinogenic to humans” – by the International Agency for Research on Cancer (IARC)
4. It is listed in either Group 2A or Group 2B by the IARC or under the category “reasonably anticipated to be carcinogens” by the NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:
   a) After inhalation exposure of 6-7 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.

A reference list can be found in Appendix C.

Cal/OSHA Regulated Carcinogens fall into a separate hazard class and have extensive additional requirements associated with them that are not covered under this procedure. The use of these agents may require personal exposure sampling based on usage. The following chemicals are Cal/OSHA regulated carcinogens:

2-Acetylaminofluorene
Acrylonitrile
4-Aminodiphenyl
Arsenic, Inorganic
Asbestos and Non Asbestiform Tremolite, Anthophyllite, and Actinolite
Benzene
Benzidine (and its salts)
1,3-Butadiene
Cadmium
bis-Chloromethyl ether
Chromium (VI)
Coke Oven Emissions
1,2 Dibromo-3-Chloropropane (DBCP)
3,3'-Dichlorobenzidine(and its salts)
4-Dimethylaminoazobenzene
Ethylene Oxide
Ethylene Dibromide (EDB)
Ethyleneimine
Formaldehyde
Lead
Methylene chloride
Methyl chloromethyl ether
4,4-Methylenebis (2-Chloroaniline)
Methylenedianiline.
alpha-Naphthylamine
beta-Naphthylamine
4-Nitrobiphenyl
N-Nitrosodimethylamine
beta-Propiolactone
Vinyl Chloride

The specific Cal/OSHA regulations that govern the use of regulated carcinogens can be found at

http://www.dir.ca.gov/Title8/sb7g16a110.html

and

http://www.dir.ca.gov/Title8/5209.html

Some exemptions from these requirements are made for laboratory scale use; these can be found at:

http://www.dir.ca.gov/Title8/5191.html

Users of regulated carcinogens should refer to the "UCLA Campus Policy For the Use of Regulated Carcinogens In Laboratories". Contact the EH&S department if there are any questions about the use of these materials.

2. Training and Documentation:

All laboratory personnel who work with or may be exposed to particularly hazardous chemicals must be adequately trained. Records of conducted training must be kept on file in the lab and should include an outline of the topics covered. Training shall include at a minimum:

- The hazards/ toxicological effects associated with the chemicals being used.
- Experimental methods and techniques for the safe use of the chemicals.
- Decontamination practices and procedures (for both emergency and routine use)
- Emergency practices and procedures.
- A review of the SOPs and material safety data sheets.

Continuing training shall be conducted as needed to maintain a working knowledge of hazards and these requirements for all staff members that work with particularly hazardous chemicals. Records are to be maintained for each training period.

3. Personal Protective Equipment (PPE):

At a minimum, safety glasses, lab coat, long pants, closed toe shoes, and gloves are required when working with particularly hazardous chemicals. Goggles may be required for processes in which a splash or spray hazard may exist.

PPE must be sufficient to protect skin from contact with the hazardous agents.

Contaminated PPE and clothing must be disposed of or decontaminated prior to removal from the designated work area. Lab coats must be decontaminated before they are removed for laundering.

Refer to the specific chemical's MSDS and SOP for specific information on additional PPE and glove selection.

4. Engineering Controls:

Benchtop work with particularly hazardous substances should be avoided whenever practical in favor of contained systems (such as fume hoods or glove boxes) and is not permitted if there is a reasonable likelihood of workers exceeding regulatory exposure limits.

Chemical fume hoods used as containment areas for particularly hazardous chemicals must have a face velocity of 100 lfm, averaged over the face of the hood and must be certified annually.

Laboratories and rooms where particularly hazardous chemicals are used shall have general room ventilation that is at negative pressure with respect to the corridors and external environment. The laboratory/room door must be kept closed at all times.

Vacuum lines are to be protected by HEPA (high efficiency particulate air) filters or higher efficiency scrubbers.

5. Special Handling & Storage Requirements:

Particularly hazardous chemicals must be stored in manner that will minimize the risk of accidental release, capped tightly and be maintained in chemical resistant secondary containment.

Segregate the chemicals from incompatible materials, as described in the UCLA Safety Manual and Chemical Hygiene Plan.

Additional requirements for the safe storage of a specific chemical may be found in the manufacturer's instructions or in the MSDS.

When transporting the chemical, the container should be protected from breakage by using a bottle carrier or other effective containment.

6. Spill & Accident Procedures:

Immediate measures must be available to prevent the possible spread of contamination.

The contaminated area shall be decontaminated and cleaned as soon as possible.

If necessary, the affected area should be evacuated as soon as an emergency is determined.

Call 911 from a UCLA *campus phone* **OR (310) 825-1491** from a *cell phone* (to UCPD) as needed.

If skin contact is involved, the worker shall be required to shower or flush the affected areas for a minimum of 15 minutes.

Report the spill to EH&S (x55689) and complete an incident report.

7. Decontamination Procedures:

Laboratory work surfaces shall be decontaminated at the conclusion of each procedure and at the end of each day.

Decontaminate all equipment before removing them from the designated area. Decontamination should be carried out in a glove box or fume hood.

Contaminated PPE must not be removed from the designated area until properly decontaminated.

After working with these chemicals, immediately remove gloves, wash hands and arms with soap and water.

8. Waste Disposal Procedures:

Waste materials that are contaminated with particularly hazardous chemicals must be disposed of as hazardous waste.

Waste containers containing particularly hazardous chemicals must be labeled:

“DANGER, CANCER HAZARD”
“DANGER, REPRODUCTIVE TOXIN”
“DANGER, ACUTE TOXIN”

as appropriate for the specific chemical hazard.

Dispose of all non-radioactive chemical waste through the UCLA Hazardous Chemical Waste Program.

9. Designated Area:

Working quantities of particularly hazardous chemicals should be kept as small as practical.

Designated area(s) for use and storage of particularly hazardous chemicals must be established. This may be specific work benches, or chemical fume hoods. When particularly hazardous chemicals are present, access to this area shall be limited to personnel following appropriate procedures who are knowledgeable in working with these particularly hazardous chemicals.

Signage is required for the container, designated work area and storage location.

Sign wording must state the following:

“DANGER, CANCER HAZARD”
“DANGER, REPRODUCTIVE TOXIN”
“DANGER, ACUTE TOXIN”

as appropriate for the specific chemical hazard.

Work surfaces should be stainless steel, plastic trays, dry absorbent plastic backed paper, chemically resistant epoxy surfaces, or other chemically impervious material.

10. Material Safety Data Sheet (MSDS) Location:

A copy of any specific regulations and the MSDS for the chemical used must be readily accessible in the lab. The specific regulation for the chemical can be accessed through EH&S.

11. Notifications:

The office of Environment, Health, and Safety must be notified prior to work starting if it is likely that regulatory exposure limits may be exceeded and immediately if members of the laboratory have become ill or exhibit symptoms associated with hazardous chemicals being used in the laboratory.