
UCLA Policy 907: Safe Handling of Particularly Hazardous Substances

Issuing Officer: Vice Chancellor for Research
Responsible Dept: Environment, Health & Safety
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I. REFERENCES

1. Title 8, California Code of Regulations (CCR), Section 5191 (Occupational Exposures to Hazardous Chemicals in Laboratories; Article 110 (Regulated Carcinogens); Section 5209 (Listed Carcinogens); Section 5203 (Report of Use Requirements); Section 5154.1 (Ventilation Requirements for Laboratory-Type Hood Operations);
2. UCLA Policy 905, Research Laboratory Personal Safety and Protective Equipment;
3. UCLA Policy 811, Environmental Health and Safety;
4. UCLA Laboratory Safety Manual (includes Chemical Hygiene Plan).

II. PURPOSE

This Policy provides general guidance on how to work safely with chemicals that have been designated as “particularly hazardous” by Cal/OSHA. It describes the minimum requirements for the safe storage, use, handling, and disposal of particularly hazardous substances, including spill and accident response procedures. Particularly hazardous substances are defined by Cal/OSHA as: reproductive toxins, acutely toxic substances and select carcinogens, which include regulated carcinogens. Refer to Attachment A, Particularly Hazardous Substances Definitions, for specific definitions.

III. STATEMENT

This Policy is applicable to, and must be adhered to by, all UCLA laboratory workers (i.e., Principal Investigators, laboratory personnel, students, visiting researchers, etc.) who use or work with particularly hazardous substances. Careful handling and stringent controls of these chemicals are essential to protect workers and the environment, and to comply with Cal/OSHA regulations.

Additional safety requirements may apply, depending on the specific chemical. For example, carcinogens that are also highly flammable require both particularly hazardous substance controls as well as fire safety controls. Contact the Office of Environment, Health & Safety (310-825-9797) for guidance on use of chemicals that may require further controls. Information and guidance on handling of particularly hazardous substances can also be found in UCLA’s Chemical Hygiene Plan.

IV. RESPONSIBILITIES

Preventing workplace injuries, exposures, and illnesses is the responsibility of every member of the campus community. Specific responsibilities are assigned to more senior members of the research and teaching community in order to implement, and ensure compliance with this Policy by their subordinate personnel.

The Chancellor has overall responsibility for compliance with health and safety requirements at all facilities and programs under campus control.

The Vice Chancellor for Research is responsible for the implementation of this Policy in all applicable research and teaching laboratories within his or her jurisdiction.

The UCLA Laboratory Safety Committee (LSC) has a broad oversight role in overseeing research activities and is responsible for promoting a safe working environment in all research and teaching laboratories on campus, and for developing, updating and maintaining policies applicable to the health and safety of laboratory work.

Department Chairpersons are responsible for communicating, promoting and enforcing this Policy in their respective research and teaching areas.

Principal Investigators and laboratory management staff are responsible for complying with this Policy and ensuring their laboratory personnel receive appropriate training and comply with this Policy as it relates to their research and teaching activities.

All Laboratory Personnel working in laboratory areas are responsible for following laboratory safety requirements, including how to work safely with substances designated as particularly hazardous.

The UCLA Office of Environment, Health & Safety (EH&S) is responsible for inspection of laboratories and for campus compliance with this Policy. In cases where laboratory activities pose an immediate danger to life or health, designated EH&S staff have the responsibility and authority to order the temporary cessation of the activity until the hazardous condition is abated.

The UCLA Chemical Hygiene Officer (CHO), also referred to as the Chemical Safety Officer, is responsible for facilitating necessary reviews of procedures that involve the use of hazardous chemicals. The reviews of procedures should primarily be provided by subject experts as part of a departmental safety committee. The CHO, with the support of other EH&S Research Safety Experts, will support, and assist in the organization of, and provide annual oversight for this process.

V. LABORATORY SAFETY REQUIREMENTS & PROCEDURES

A. Laboratory Specific Standard Operating Procedures

1. Individual laboratory groups must prepare and maintain laboratory-specific standard operating procedures (SOP) for identifying hazards and handling methods to avoid exposure to particularly hazardous substances. The procedures must indicate the designated use areas, limitations on the quantities and procedures used, information on containments, and information on hazards involved. These procedures may be specific to particular substances or generalized over a group of chemicals with similar hazardous properties and use limitations. Chemical-specific procedures must be developed for each Cal/OSHA regulated carcinogen and procedures should be developed for reproductive toxins, acutely toxic materials, and select carcinogens. EH&S can provide additional guidance for specific chemical hazards.
2. A copy of the particularly hazardous substances procedures, including laboratory specific information, and the Material Safety Data Sheets (MSDS) for the chemical(s) used must be readily accessible in the lab.
3. EH&S must be notified immediately via the EH&S Hotline at 310-825-9797 if members of the laboratory become ill or exhibit signs or symptoms associated with exposure to hazardous chemicals used in the laboratory. Affected employees must be provided immediate first aid and medical surveillance within 24-hours of the event.
4. Principal Investigators must identify what classes of particularly hazardous substances are in use in their labs on their Laboratory Hazard Assessment Tool (LHAT), which must be completed as conditions change in the laboratory, or at least once each calendar year.

B. Training and Documentation

1. All laboratory personnel who work with or may be exposed to particularly hazardous substances must be provided laboratory-specific training and information by the Principal Investigator or their designee prior to beginning their initial assignment. Laboratory-specific training should cover specific policies and procedures, etc. and is in addition to the basics covered in the Laboratory Safety Fundamental Concepts training. Records of laboratory-specific training must be maintained in the laboratory and should include an outline of the

topics covered. See <http://ehs.ucla.edu/LabTrainingRecord.pdf> for a sample documentation form. Training shall include:

- The hazards/toxicological effects associated with the chemicals being used.
 - Routine procedures and decontamination methods.
 - Emergency response practices and procedures.
 - Methods and observations for detecting the presence or release of hazardous chemicals.
 - Available protection measures, including appropriate work practices and personal protective equipment (PPE).
 - A review of written SOP and MSDSs and the Chemical Hygiene Plan (CHP).
 - A review of this Policy.
2. All laboratory personnel are responsible for knowing and complying with all safety guidelines, regulations, and procedures required for the task assigned and for reporting unsafe conditions, accidents or near misses to the Principal Investigator, immediate laboratory management staff or EH&S.
 3. Continuing training shall be conducted as needed to maintain a working knowledge of hazards and the safety requirements for all laboratory personnel who work with particularly hazardous substances, including an annual refresher for particularly hazardous substances. Written records must be maintained for each training session. See <http://ehs.ucla.edu/LabTrainingRecord.pdf> for a sample documentation form.

C. Use in Designated Areas

1. Designated area(s) for use of particularly hazardous substances must be formally established by developing SOPs and posting appropriate signage. This designated area(s) may be an entire laboratory, a specific work bench, or a chemical fume hood. When particularly hazardous substances are in use, access to the designated area shall be limited to personnel following appropriate procedures and who are trained in working with these chemicals.
2. Access to areas where particularly hazardous substances are used or stored must be controlled by trained employees. Working quantities of particularly hazardous substances should be kept as small as practical and their use should be physically contained as much as possible, usually within a laboratory fume hood or glove box. It is the responsibility of each Principal Investigator, or their designee, to train and authorize their staff for these operations and to maintain documentation of this training and authorization.
3. Signage is required for all containers, designated work areas and storage locations. Sign wording must state the following as appropriate for the specific chemical hazard:

“DANGER, CANCER HAZARD – SUSPECT AGENT”

“DANGER, CANCER HAZARD – REGULATED CARCINOGEN”

“DANGER, REPRODUCTIVE TOXIN”

“DANGER, ACUTE TOXIN”

Entrances to designated work areas and storage locations must include signage, “AUTHORIZED PERSONNEL ONLY”, in addition to the above specific hazard warning wording. Signage templates can be obtained from the UCLA Chemistry and Biochemistry safety webpage.

4. Work surfaces should be stainless steel, plastic trays, dry absorbent plastic backed paper, chemically resistant epoxy surfaces, or other chemically impervious material.
5. Protocols, procedures, and experiments must be designed and performed in a manner to safely maintain control of the particularly hazardous substances. Laboratory personnel must specifically consult with their Principal Investigators if a special hazard is involved (e.g., material under pressure) or if they are uncertain of the potential hazards.

D. Personal Protective Equipment (PPE)

1. PPE must be sufficient to protect eyes and skin from contact with the hazardous agents. At minimum, safety glasses, lab coat, long pants, closed toe shoes, and gloves are required when working with particularly hazardous substances. See UCLA Policy 905, Research Laboratory Personal Safety and Protective Equipment for more information. Goggles may be required for processes in which a splash or spray hazard may exist and flame resistant lab coats may be required if the chemicals being used are flammable.
2. Refer to the specific chemical's MSDS and SOP for specific information on additional PPE and glove selection.
3. Contaminated PPE and clothing must be disposed of or decontaminated prior to removal from the designated work area. While small spots of contamination may be cleaned in the lab, grossly contaminated lab coats may need to be disposed of as dry hazardous waste. Refer to UCLA Policy 905 and the Chemical Hygiene Plan for guidance on handling contaminated protective apparel and other PPE.

E. Engineering Controls

1. Bench top 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. For questions regarding exposure limits and for assistance in conducting a hazard assessment for uncontained procedures, contact the EH&S Hotline at 310-825-9797.
2. Laboratories and rooms where particularly hazardous substances are used outside of containment systems must have general room ventilation that is maintained at negative pressure with respect to public areas. Air from these ventilation systems must be vented externally; recirculation is not permitted. Doors providing access from public areas must be kept closed.

F. Special Handling & Storage Requirements

1. Particularly hazardous substances must be stored in a designated area and used in a manner that will minimize the risk of accidental release (e.g., capped tightly, use of chemical resistant secondary containment, whenever possible). Laboratory personnel should remove chemicals from storage only as needed and return them to storage as soon as practical.
2. Chemicals should be segregated from incompatible materials, as described in the UCLA Chemical Hygiene Plan. The use of particularly hazardous substances must be confined to an established designated area (see C. Use in Designated Areas, above).
3. Additional requirements for the safe storage of a specific chemical may be found in the manufacturer's instructions or in the MSDS.
4. When transporting chemicals beyond the immediate laboratory environment, containers should be protected from breakage by using a bottle carrier or other effective containment.
5. Contact the EH&S Hotline at 310-825-9797 for guidance on the planned use of chemicals that may require further controls.

G. Spill & Accident Procedures

1. Immediate measures must be available to prevent the possible spread of contamination in the event of a small spill of a particularly hazardous substance. Absorbent materials and clean up materials should be available in all laboratories sufficient to contain and decontaminate individuals and equipment and areas. Any known spills must be contained and decontaminated as soon as possible.
2. In the event of a large spill that is beyond a laboratory group's immediate response capabilities, the following procedures should be followed:
 - a. Evacuate the area immediately.
 - b. Restrict access to the affected areas to emergency responders and post signage and barriers as needed to prevent unauthorized entry.

- c. Contact EH&S Hazmat immediately for response and remediation. Call 911 from a UCLA campus phone, or (310) 825-1491 from a cell phone (to UCPD) as needed.
3. In the event of direct skin contact with a particularly hazardous substance, the affected person must shower or flush the affected areas for a minimum of 15 minutes. Whenever personal contamination occurs, the event must be reported to EH&S at (310-825-9797) and an incident report will be completed and maintained by EH&S.
4. If the spill involves acutely toxic materials, the spill should be treated as a large spill if there is any doubt about the group's ability to safely mitigate the spill.
5. If the spill involves regulated carcinogens, a Report of Use may need to be filed (see J. Regulated Carcinogens and Report of Use Requirements, below).

H. Routine Decontamination Procedures

1. To limit the spread of contamination, laboratory work surfaces should be decontaminated at the conclusion of each procedure and at the end of each day on which particularly hazardous substances are used.
2. All equipment should be decontaminated before removing it from the designated area; this decontamination should be carried out in a glove box or fume hood where practical.
3. Contaminated PPE must not be removed from the designated area until properly decontaminated; refer to UCLA Policy 905 and the Chemical Hygiene Plan for guidance on the cleaning of protective apparel and other PPE. After working with these chemicals, gloves must immediately be removed and disposed of as hazardous waste and hands and arms washed with soap and water.

I. Waste Disposal Procedures

1. Disposal of waste materials that include particularly hazardous substances must comply with the hazardous chemical waste disposal procedures found in the Laboratory Safety Manual.
2. In addition to general hazardous waste labeling requirements, waste containers containing particularly hazardous substances must also be labeled as appropriate for the specific chemical hazard:
 - “DANGER, CANCER HAZARD – SUSPECT AGENT”
 - “DANGER, CANCER HAZARD – REGULATED CARCINOGEN”
 - “DANGER, REPRODUCTIVE TOXIN”
 - “DANGER, ACUTE TOXIN”

Signage templates can be obtained from the UCLA Chemistry and Biochemistry safety webpage.

3. All non-radioactive chemical waste must be disposed of through the UCLA Hazardous Chemical Waste Program. Mixed wastes of hazardous chemicals and radioactive material are disposed of through the Radiation Safety Department. Due to regulatory restrictions and the high cost of disposal, the Radiation Safety Department should be contacted prior to producing mixed wastes.

J. Regulated Carcinogens and Report of Use Requirements

1. Regulated carcinogens are a specific subset of select carcinogens which have special additional requirements associated with their use under certain circumstances. See Attachment B for the specific list. EH&S maintains an air sampling program to monitor individuals to determine if they are, or may reasonably be expected to, exceed short or long term exposure limits. Every effort should be made to keep exposure levels below these limits by using fume hoods, limiting the quantities used, and following SOP designed to reduce exposure. If levels cannot be kept below these levels, additional requirements may include:
 - Required medical evaluations.
 - Additional documented training.
 - Use of respirators with required initial and ongoing training, medical evaluations, and maintenance documentation.

- Additional documented hazard evaluations.
2. Listed carcinogens are a further subset of regulated carcinogens. See Attachment C for the specific list. The use of these materials must be registered with EH&S through the Laboratory Hazard Assessment Tool or other equivalent EH&S approved process. An evaluation will be completed to assess safety requirements for groups that use these materials.

Report of Use Requirements must be met for each group when they:

- Begin the use of, or make significant changes to existing use of any listed carcinogen.
- Use regulated carcinogens such that there is a reasonable expectation that exposure limits may be exceeded.
- In the event of an emergency in which employees have been exposed to any regulated carcinogen.

VI. ATTACHMENTS

- A. Particularly Hazardous Substances Definitions
- B. Regulated Carcinogens
- C. Listed Carcinogens

Issuing Officer

/s/ James S. Economou

Vice Chancellor for Research

**Questions concerning this policy or procedure should be referred to
the Responsible Department listed at the top of this document.**

ATTACHMENT A
Particularly Hazardous Substances Definitions

Particularly hazardous substances fall into the following three major categories: acute toxins, reproductive toxins and carcinogens.

Acute Toxins

Substances that have a high degree of acute toxicity are substances that may be fatal or cause damage to target organs as the result of a single exposure or exposures of short duration. 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; and
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.

Reproductive Toxins

Reproductive toxins include any chemical that may affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis). A list of reproductive toxins is maintained online at http://www.oehha.ca.gov/prop65/prop65_list/Newlist.html#files.

Carcinogens

Carcinogens are chemical or physical agents that cause cancer. Generally, they are chronically toxic substances; that is, they cause damage after repeated or long-duration exposure, and their effects may only become evident after a long latency period.

The term “regulated carcinogen” means a recognized cancer causing substance, compound, mixture, or product regulated by Cal/OSHA sections 1529, 1532, 1532.2, 1535, 8358, 8359 or Article 110, sections 5200-5220. *See Attachment B for the specific list of Regulated Carcinogens.*

The term “Listed Carcinogen” refers to a specific list of 13 chemicals regulated by Cal/OSHA and Federal OSHA and has specific use and handling requirements. *See Attachment C for the specific list of Listed Carcinogens.*

The term “select carcinogen” refers to 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; or
2. It is listed under the category “known to be carcinogens” in the annual report by the National Toxicology Program (NTP); or
3. It is listed under Group 1 – “carcinogenic to humans” – by the International Agency for Research on Cancer (IARC); or
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.

ATTACHMENT B
Regulated Carcinogens

The term “regulated carcinogen” means a recognized cancer causing substance, compound, mixture, or product regulated by Cal/OSHA sections 1529, 1532, 1532.2, 1535, 8358, 8359 or Article 110, sections 5200-5220. For more information, see UCLA Policy 907.

- Acrylonitrile
- Arsenic metal and inorganic arsenic compounds
- Asbestos
- Benzene
- 1,3-butadiene
- Cadmium metal and cadmium compounds
- Chromium(VI) compounds
- Coke Oven Emissions
- 1,2-Dibromo-3-chloropropane (DBCP)
- Ethylene Dibromide (EDB)
- Ethylene Oxide (EtO)
- Formaldehyde gas and formaldehyde solutions
- Lead metal and inorganic lead compounds
- Methylene Chloride
- 4,4'-Methylene bis(2-chloroaniline) (MBOCA)
- Methylenedianiline (MDA)
- Vinyl Chloride
- 2-Acetylaminofluorene
- 4-Aminodiphenyl
- Benzidine (and its salts)
- 3,3'-Dichlorobenzidine (and its salts)
- 4-Dimethylaminoazobenzene
- alpha-Naphthylamine
- beta-Naphthylamine
- 4-Nitrobiphenyl
- N-Nitrosodimethylamine
- beta-Propiolactone
- bis-Chloromethyl ether
- Methyl chloromethyl ether
- Ethyleneimine

ATTACHMENT C
Listed Carcinogens

The term “listed carcinogen” refers to a specific list of 13 chemicals regulated by Cal/OSHA and Federal OSHA and has specific use and handling requirements. For more information, see UCLA Policy 907.

- 2-Acetylaminofluorene
- 4-Aminodiphenyl
- Benzidine (and its salts)
- 3,3'-Dichlorobenzidine (and its salts)
- 4-Dimethylaminoazobenzene
- alpha-Naphthylamine
- beta-Naphthylamine
- 4-Nitrobiphenyl
- N-Nitrosodimethylamine
- beta-Propiolactone
- bis-Chloromethyl ether
- Methyl chloromethyl ether
- Ethyleneimine