

STANDARD OPERATING PROCEDURES
Museum of Vertebrate Zoology
Herpetology Preparation Laboratory
U.C. Berkeley
Room 3130 Valley Life Sciences Building

Intent: This document describes the potential hazards associated with this laboratory and describes safety and emergency procedures.

Dial 911 for life threatening emergencies. If using a cell phone, dial 510-642-3333 (UCPD).

Health Care Providers:

University Health Services/Tang Center Urgent Care

2222 Bancroft Way #4300
Berkeley, CA 94720-4300
(510) 643-7197
open 8-6 M-Sat, 11-3 Sunday

Alta Bates Hospital Emergency

2450 Ashby Avenue
Berkeley, CA 94705
(510) 204-4444

Emergency Contacts:

Museum of Vertebrate Zoology:

Jim McGuire (Faculty Curator)
510-316-6201 (Mobile)

Carol Spencer (Staff Curator)
510-290-7868 (Mobile)
510-643-5778 (Office)

Chris Conroy (Staff Curator and Safety Officer)
510-384-7437 (Mobile)
510-643-7709 (Office)

MVZ Front Office (Business Hours Only)
510-642-3567

VLSB Facilities: Building Emergency

Adam Doban (VLSB Facilities Specialist)
Office: Room 3028
510-333-9523 (Mobile)

UC Berkeley EH&S: <http://www.ehs.berkeley.edu/>

Definitions:

Ethanol: An organic chemical used as a general all-purpose organic solvent, disinfectant, reagent and preservative.

Formaldehyde: An organic chemical used as a fixative and preservative. Formaldehyde solution can be useful as a disinfectant as it effectively kills most bacteria and fungi. Formaldehyde is commonly used in histology techniques to preserve or fix tissues or cells. Formaldehyde solution is a combustible corrosive liquid.

Formalin: An aqueous solution of formaldehyde that is 37% by weight. To create 10% formalin solution, 37% formaldehyde (formalin) is diluted 10 to 1 with water.

Potential Hazards:

Ethanol: WARNING - Ethanol is extremely flammable and poses a serious fire risk.

Inhalation: High vapor concentrations may cause a burning sensation in the throat and nose, as well as stinging and watering of the eyes. High concentrations may cause irritation, dizziness, faintness, drowsiness, nausea and vomiting.

Ingestion: May cause dizziness, faintness, drowsiness, decreased awareness and responsiveness, euphoria, abdominal discomfort, nausea, vomiting, staggering gait, lack of coordination and possibly coma.

Eye Contact: Vapors can severely irritate eyes. Eye damage from contact with liquid is reversible with proper treatment and will result in full recovery within several days. Damage is usually mild to moderate conjunctivitis, which appears visibly as redness of the conjunctiva.

Chronic Exposure: Long-term repeated oral exposure to ethanol may result in the development of progressive liver injury with fibrosis.

Aggravation of Pre-existing Conditions: Repeated exposure to ethanol may exacerbate already present liver injuries.

Other Effects of Over-exposure: Repeated ingestion of ethanol by pregnant women has been shown to adversely affect the central nervous system of the fetus, producing a collection of effects that together constitute the fetal alcohol syndrome.

Formalin: OSHA classifies formaldehyde and formalin as select carcinogens. Symptoms of exposure include irritation and burning of the eyes, skin and respiratory tract, tightening of the chest, headaches, and palpitations of the heart.

Acute Effects: Exposure to gaseous formaldehyde by inhalation may result in sensory irritation of the upper respiratory tract and eyes. Skin contact with formaldehyde may result in irritation and dermatitis. Exposure to the eye may result in corneal damage.

Ingestion of formalin poses a serious danger; medical attention should be sought immediately.

Routes of Exposure: Formaldehyde can directly enter the body through the eyes, mucous membranes, or the skin via absorption. Formaldehyde can also be inhaled or ingested.

Chronic Effects: Prolonged respiratory exposure to formaldehyde may result in asthma and chronic bronchitis. High concentrations of inhalation may cause anosmia (loss of smell) and pulmonary edema. If ingested may result in severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea. Repeated eye contact may result in conjunctivitis and blindness. Other effects may include central nervous system depression, as well as liver and kidney damage.

Cancer Hazard: There is sufficient evidence that formaldehyde causes nasopharyngeal cancer in humans as well as limited evidence that it causes cancer of the nasal cavity and paranasal sinuses. There is also strong, but not sufficient evidence that formaldehyde causes leukemia.

Reproductive Hazard: May cause adverse reproductive effects.

Description of Procedures for Ethanol and Formalin:

1. All persons shall consult the Material Safety and Data Sheet and SOP on ethanol and formalin before working with these chemicals. It is the responsibility of the employer to make sure inexperienced persons have read and understood the MSDS and SOP on chemical usage before working.
2. All persons shall be required to wear personal protective equipment (PPE) when working with ethanol and formalin. See section at end for description of PPE.
3. All persons working with formalin will do so inside the fume hood, using all PPE listed below plus nitrile gloves (not latex).
4. Persons using chemicals shall make themselves aware of the location of fire extinguishers, eyewashes, safety showers, safety kits and any other safety/fire fighting equipment. The fire extinguisher is located next to the sink inside the herp lab. The eyewash and safety shower is located directly outside the lab entrance. The spill cart is located in the lab.
5. Ethanol and formalin are to be transported in appropriate containers, including plastic jugs or other containers with sealed lids.
6. Ethanol and Formalin are NOT to be stored in any container other those mentioned.
7. Once finished in the herp lab all persons are to make sure that all work surfaces are clean and wiped down and that any waste material (such as paper towels) containing chemicals are disposed of properly.

Waste Management and Environmental Responsibility:

Waste disposal procedures:

Before disposing of waste or cleaning up spill, contact Carol Spencer and Chris Conroy for any spill or problem. If emergency, proceed to Eye Wash, Emergency Shower, or directly to Tang Center or Alta Bates Hospital

1. Solid waste containing ethanol (such as paper towels, rags, etc.) is to be disposed of into waste bins. Formalin solid waste without blood should be disposed of in the waste bin after the used formalin has been squeezed out into the "Used Formalin" container, while wearing appropriate safety gear (see PPE below). Formalin solid waste containing blood should be disposed of in Biohazard bags. Use of formalin should occur in the hood.

2. Ethanol and formalin are **NOT** to be poured into the sink. Persons who wish to dispose of ethanol or formalin should do so in the used ethanol or used formalin containers found next to the hood. Extra containers can be found in the small ethanol room (Room 3134). See Chris Conroy/ Carol Spencer to arrange for disposal of waste ethanol or formalin with EH&S.

Handling and Storage Requirements:

Large quantities of ethanol are to be stored in the approved flammable solvent cabinet, and are to be kept away from heat, sparks and flames. Large quantities of formalin and ethanol are kept in the small ethanol room (3134) or in the ethanol specimen rooms. Smaller quantities of ethanol and formalin are to be stored in containers outlined above in Description of Procedures for Ethanol and Formalin. Containers not in use should be kept tightly sealed. Persons using ethanol and formalin must always do so with adequate ventilation. Avoid contact with eyes and skin. Avoid breathing vapors and wash exposed skin thoroughly after handling. Workers should take precautions to prevent static electricity buildup when transferring contents and handling ethanol.

Contingency Plan and Reporting:

All accidents and spills will be reported to supervisors (Carol Spencer/Chris Conroy).

Accident response:

Fire: Immediately dial 911 from the lab phone (or UCPD 510-642-3333 if calling from a cell phone) to report fire. A fire extinguisher is located in the herp lab, next to the entry/exit door.

If a person is caught on fire they should immediately seek the safety shower or wrap themselves in a fire blanket. **If injury occurs the individual should seek immediate medical attention by using the first aid kit and by dialing 911 (or UCPD 510-642-3333 if calling from a cell phone).** If there are other persons in the area they are to act immediately by using the fire extinguisher, wrapping the person in a fire blanket or by using other means to put out the fire. If the individual is injured, administer first aid and dial 911 (or UCPD 510-642-3333 if calling from a cell phone).

Other incidents:

For first aid measures for specific accidents involving ethanol and formalin, consult the Material Safety Data Sheets. A first aid kit is located in the herp lab, to the left of the sink on the wooden shelf. A more extensive first aid kit is at the MVZ Front desk.

Spill clean-up:

All labs should have a spill kit available (located on the spill cart in the herp lab). In order to clean a spill, first contain the spilled material. Before cleaning the spill make sure to provide adequate ventilation and use protective equipment. The spill may then be cleaned up immediately using paper towels or other absorbent material.

Other Potential Hazards:

Water Leaks: Water can drip on to the floor from the sink, potentially creating a slipping hazard. Paper towels may be used to clean a water puddle by absorption.

Obstacles: Caution should be taken when moving about the lab. Be aware of your surroundings, as cables, boxes, and other equipment can pose potential hazards.

Personal Protective Equipment (PPE) to be worn in the Herp Lab:

If anyone is using chemicals or opening jars with ethanol or formalin (formalin only in the hood) in the Herp Lab, all persons in the lab must be wearing the following PPE:

1) Flame Resistant Blue Lab Coat, 2) Chemical Splash Goggles or Safety Glasses (prescription glasses alone are not enough), 3) Latex or Nitrile Gloves, 4) Long pants and socks to cover all exposed skin, 5) Closed-Toe Shoes.

All work with formalin should occur in the fume hood, wearing all PPE items listed above, plus using Nitrile gloves.

When coats become soiled, bring them to Carol Spencer or Chris Conroy, who will take them to the appropriate lab coat cleaning drop-off in VLSB.

Do NOT EAT OR DRINK IN THE LAB.

You must acknowledge that you have read this document and sign/date it in person with Carol Spencer.