Handout Set for UCSB Online Training:

Fundamentals of Laboratory Safety

Prepared by UCSB Environmental Health & Safety

Revised 10/2014
Overview: The UCSB Injury & Illness Prevention Program

What is the Injury and Illness Prevention Program?

In short, this California worker-protection law¹ requires employers like UCSB to establish the following safety program elements and employee rights and apply them all campus workers, regardless of your particular job duties:

1. Ensure that workers are trained in, and comply with, safe work practices
2. Inspect for unsafe/unhealthy work conditions and correct as soon as possible
3. Maintain documentation of all safety training and inspections
4. Encourage workers to report suspected unsafe conditions without fear of reprisal (Hazard Reporting Form)
5. Communicate safety issues in a way that is understandable to all workers
6. Report and investigate all occupational injuries promptly
   - Report employee injuries immediately: 1-877-682-7778
   - Injury Report Form, supervisor submit as soon as possible: http://www.workcomp.ucsb.edu/Incident_Report_Form.pdf

How is the IIPP Implemented at UCSB?

- Although responsibility for the IIPP exists at all levels of the University, the primary implementer of the six elements above is the employee’s supervisor (faculty or staff). Environmental Health & Safety is also available to offer training on selected topics, perform safety inspections/investigations and offer general consultation on safety issues to the campus community.

- Each department has a written IIPP plan as required by OSHA. Your plan should be maintained by your local Department Safety Rep within the UCSB Health and Safety Binder. You have the right to see the written program upon request.

- Each department has a “Safety Bulletin Board” where IIPP-related documents are posted. The board is generally located in the departmental administrative offices.

¹-http://www.dir.ca.gov/Title8/3203.html
1. PRODUCT AND COMPANY IDENTIFICATION
   Product name: Phenol

2. HAZARDS IDENTIFICATION
   GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
   Acute toxicity, Oral (Category 3), H301
   Acute toxicity, Inhalation (Category 3), H331
   Acute toxicity, Dermal (Category 3), H311
   Skin corrosion (Category 1B), H314
   Serious eye damage (Category 1), H318
   Germ cell mutagenicity (Category 2), H341
   Specific target organ toxicity - repeated exposure (Category 2), H373
   Acute aquatic toxicity (Category 3), H402
   Chronic aquatic toxicity (Category 2), H411

   GHS Label elements, including precautionary statements
   Pictogram
   Signal word Danger

3. COMPOSITION/INFORMATION ON INGREDIENTS
   Synonyms: Hydroxybenzene
   Molecular weight: 94.11 g/mol
   CAS-No.: 108-95-2

4. FIRST AID MEASURES
   If inhaled
   If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
   In case of skin contact
   Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.
   In case of eye contact
   Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.
   If swallowed
   Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES
   Suitable extinguishing media
   Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

6. ACCIDENTAL RELEASE MEASURES
   Personal precautions, protective equipment and emergency procedures
   Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

7. HANDLING AND STORAGE
   Precautions for safe handling
   Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION
   TWA 5 ppm or 19 mg/m3. Occupational Exposure Limits (OSHA) - Central Nervous System impairment, Upper Respiratory Tract irritation, Lung damage, Not classifiable as a human carcinogen
   Exposure controls
   Appropriate engineering controls
   Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES
   Information on basic physical and chemical properties
   Flash point 79.0 °C (174.2 °F)
   pH 6.0

10. STABILITY AND REACTIVITY
    Chemical stability
    Stable under recommended storage conditions.
    Incompatible materials
    Strong oxidizing agents, Strong bases, Strong acids

11. TOXICOLOGICAL INFORMATION
    Information on toxicological effects
    Acute toxicity
    LD50 Oral - Rat - 410.0 - 650.0 mg/kg
    LD50 Oral - Rat - 317.0 mg/kg
    LC50 Inhalation - Rat - 8 h - 900 mg/m3
    Dermal - Rabbit - 630.0 mg/kg

12. ECOLOGICAL INFORMATION
    Adverse effects
    An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS
    Waste treatment methods:
    Contact a licensed professional waste disposal service to dispose of this material.

14. TRANSPORT INFORMATION
    DOT (US) UN number: 1671 Class: 6.1
    Packing group: II Proper shipping name: Phenol, solid Reportable Quantity (RQ): 1000 lbs
    Poison Inhalation Hazard: No

15. REGULATORY INFORMATION
    California Prop. 65 Components
    This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION
    NFPA Rating
    Health hazard: 3
    Fire Hazard: 2
    Reactivity Hazard: 0

UCSB Safety Data Sheets (SDS) are available online EH&S homepage: ehs.ucsb.edu
Bookmark the SDS link for quick access.
Pictograms and Hazard Codes Used in the Globally-harmonized Chemical Labeling System

All chemical containers provided by vendors will eventually use the following labeling system. Per Cal-OSHA employees need to be familiar with the labeling system and its relevance to the hazards of hazardous materials.

<table>
<thead>
<tr>
<th>Description</th>
<th>Pictogram</th>
<th>Hazard class and hazard category:</th>
</tr>
</thead>
</table>
| Exploding Bomb GHS01      | ![Pictogram](image) | Unstable explosives  
Explosives of Divisions 1.1, 1.2, 1.3, 1.4  
Self reactive substances and mixtures, Types A,B  
Organic peroxides, Types A,B |
| Flame GHS02               | ![Pictogram](image) | Flammable gases, category 1  
Flammable aerosols, categories 1,2  
Flammable liquids, categories 1,2,3  
Flammable solids, categories 1,2  
Self-reactive substances and mixtures, Types B,C,D,E,F  
Pyrophoric liquids, and solids, category 1  
Self-heating substances and mixtures, categories 1,2  
Substances and mixtures, which in contact with water, emit flammable gases, categories 1,2,3  
Organic peroxides, Types B,C,D,E,F |
| Flame Over Circle GHS03   | ![Pictogram](image) | Oxidizing gases, category 1  
Oxidizing liquids, categories 1,2,3 |
| Gas Cylinder GHS04        | ![Pictogram](image) | Gases under pressure:  
- Compressed gases  
- Liquefied gases  
- Refrigerated liquefied gases  
- Dissolved gases |
| Corrosion GHS05           | ![Pictogram](image) | Corrosive to metals, category 1  
Skin corrosion, categories 1A,1B,1C  
Serious eye damage, category 1 |
| Skull and Crossbones GHS06| ![Pictogram](image) | Acute toxicity (oral, dermal, inhalation), categories 1,2,3 |
| Exclamation Mark GHS07    | ![Pictogram](image) | Acute toxicity (oral, dermal, inhalation), category 4  
Skin and eye irritation, category 2  
Skin sensitisation, category 1  
Specific Target Organ Toxicity – Single exposure, category 3 |
| Health Hazard GHS08       | ![Pictogram](image) | Respiratory sensitization, category 1  
Germ cell mutagenicity, categories 1A,1B,2  
Carcinogenicity, categories 1A,1B,2  
Reproductive toxicity, categories 1A,1B,2  
Specific Target Organ Toxicity – Single exposure, categories 1,2  
Specific Target Organ Toxicity – Repeated exposure, categories 1,2  
Aspiration Hazard, category 1 |
| Environment GHS09         | ![Pictogram](image) | Hazardous to the aquatic environment  
- Acute hazard, category1  
- Chronic hazard, categories 1,2 |
Obtaining Your Free PPE

Individuals who have not previously received their PPE can now do so via these steps:

1. Ask your PI/supervisor to add you into their Laboratory Hazard Assessment Tool (“LHAT”) account. They may have delegated that task to another individual.

2. Go to the LHAT: https://ehs.ucop.edu/lhat/ Login using your UCSB NetID and password. Complete the required steps:
   a. Complete and certify the short training and quiz
   b. Certify you’ve reviewed your lab’s hazard assessment
   c. Print PPE voucher

3. Take your PPE voucher to the graduate storeroom in the Chemistry building (bldg. 557), room 1432. You will receive a fitted lab coat(s) and safety eyewear from staff.

Why Provide Free PPE and Require Documentation?

UC Personal Protective Equipment Policy was developed to ensure UC workers have appropriate PPE and that UC is in compliance with worker safety regulations, i.e. Cal-OSHA. In short, any employer is obligated to:

- Assess and document the hazards of their worker’s activities
- Provide appropriate PPE based on the assessment at no cost to the worker
- Provide documented training on proper PPE use and maintenance
- Provide a free method for worker’s to clean/sanitize their PPE

To meet these requirements, UC developed the LHAT and started a free lab coat laundering service. It is important that every lab worker go through the LHAT process and not simply be handed a used lab coat and eyewear that are leftover around the lab. That process does not generate any of the above OSHA-satisfying documentation for that worker, nor ensure issuance of appropriate and well-fitted PPE.

Related Issues

- To keep the PPE program financially sustainable

  A lab coat “loaner program” for individuals only working for short periods on campus is available.

  A lab coat “recycling program” is available to collect unwanted/un-needed coats for laundering and reuse. Just drop them off at the designated trash bin next to laundry pick up area.

Lab coat laundering, if you have not previously laundered your coat, you need to follow these steps to have your cleaned coat returned to you successfully.

1. Place your dirty coat into the laundry hamper at your assigned “home” location where you want it returned; per the designated area established during the lab coat fitting.
2. It is important to note that wherever your dirty coat is picked up, is where it will be returned.
3. If your coat is lost during laundering, please contact Chandra.Feeser@ehs.ucsb.edu
U.C. PERSONAL PROTECTIVE EQUIPMENT POLICY

THE BASICS:
Minimum PPE for Entering a Laboratory Area: **Long Pants and Closed Toed Shoes**

PPE While Manipulating Hazardous Materials/Processes: **Appropriate Lab Coat and Safety Eyewear**

PPE While Adjacent to the Manipulation of Hazardous Materials/Processes: **Same PPE as Those Doing the Work**

ADDITIONAL PPE AS DETERMINED BY LHAT AND SOP’S:

**Face Shield**
- **Consider use when handling:**
  - Hazardous liquids with a splash hazard
  - Pyrophoric, water reactive or potentially explosive chemicals
  - Cryogenic liquids
  - High pressure or vacuum systems

**Splash Goggles**
- **Use when handling:**
  - Hazardous liquids when >4L or with a splash hazard
  - Corrosives when >4L
  - Cryogenic or scalding liquids when >4L

**Gloves**
- **Use appropriate gloves when handling:**
  - Hazardous, toxic or corrosive chemicals, engineered nanomaterials, unsealed radioactive materials
  - Cryogenic liquids or dry ice
  - Biohazards (double glove for BSL-2 or greater)

**Chemical Resistant Apron**
- **Use when handling:**
  - Minor spill clean-up
  - Corrosives >4L

**Use when handling:**
- Hazardous liquids w/splash hazard
- Acutely toxic chemicals
- High pressure or vacuum systems

See full PPE policy, LHAT, and your lab SOP’s for more details. Additional requirements may apply as determined by the campus biosafety, radiation and animal care committees.
Laboratory Sharps Disposal

Definitions:
“Sharps waste” means any device having acute rigid corners, edges, or protuberances capable of cutting or piercing, including, but not limited to, all of the following: hypodermic needles, syringes, razor blades and scalpel blades. Glass items contaminated with biohazards, such as pipettes, microscope slides and capillary tubes are also considered a “sharps waste.”

Under no circumstances should “sharps waste” be disposed of in the normal trash. Sharps must be disposed of through Environmental Health & Safety (EH&S) or a certified medical waste management company.

Sharps Contaminated with Hazardous Chemical Waste
1. Place in a rigid, puncture-resistant container which, when sealed, is leak proof. Examples below.
2. Deface any biohazard symbols, if present.
3. Label the container with a hazardous waste label and include the chemical constituents.
4. Submit an online Chemical Waste Collection Request via the EH&S website. Please note on the request that the material is not biologically contaminated.

Sharps Contaminated with Radioactive Materials
1. Place in a rigid, puncture-resistant container which, when sealed, is leak proof. Examples below.
2. Deface any biohazard symbols, if present.
3. Label the container with a radioactive waste label and include the radioactive isotope.
4. Submit an online Radioactive Waste Collection Request via the EH&S website. Please note on the request that the material is not biologically contaminated.

Sharps Contaminated with Medical or Biohazardous Waste
1. Place in an approved biohazardous sharps container that is red, rigid, puncture-resistant and which, when sealed, is leak proof and cannot be opened without great difficulty - pictured below.
2. Autoclave your sharps container for a minimum of 30 minutes at 121°C and 15psi.
3. Label the sharps container with the words “autoclaved”.
4. Submit an online Chemical Waste Collection Request via the EH&S website. Please note on the request that the material has been autoclaved. Or leave your autoclaved sharps container at Bio II 4106, LSB 2204, LSB 4218 or Chem 1201, where it will be picked up without a request.

OR
1. Place in an approved biohazardous sharps container that is red, rigid, puncture-resistant and which, when sealed, is leak proof and cannot be opened without great difficulty.
2. Contract with a certified medical waste management company to pickup your medical or biohazardous sharps waste.

Unused or Non-Contaminated Hypodermic Needles
1. Place in an approved biohazardous sharps container that is rigid, puncture-resistant and which, when sealed, is leak proof and cannot be opened without great difficulty - examples below.
2. Deface any biohazard symbols, if present.
3. Submit an online Chemical Waste Collection Request via the EH&S website. Please note on the request that the material is not biologically contaminated.

Questions? Contact Bruce Carter 893-3293 or Matthew O’Carroll 893-2661, x2302
Laboratory Glass Disposal

**Definition:** Laboratory glass is defined as equipment generally made of pyrex, borosilicate, and quartz glass used for scientific experiments. Examples of laboratory glass include, but are not limited to, the following: beakers, flasks, graduated cylinders, stirring rods, test tubes, microscope slides, glass pipettes, glass petri dishes, and glass vials. **Glass items contaminated with biohazards, such as pipettes, microscope slides, and capillary tubes are considered “sharps waste”. Under no circumstances should “sharps waste” be disposed of in the normal trash. Sharps must be disposed through EH&S or a certified medical waste management company.**

**Directions:**

1. Prior to utilizing the cardboard lab glass box, duct tape the bottom to ensure the container is secure.
   - Labs can use a 32gal. red lidded cart to house cardboard lab glass box for ease of transport. *(loose lab glass cannot be placed in red lidded cart)*
2. Place appropriate unwanted lab glass in the cardboard lab glass box. Non-lab glass, such as beverage containers should be placed in recycling receptacles, and not disposed along with laboratory glass waste.
3. When full, use duct tape to secure the lid to the body of the box. Be sure that the lid is securely fastened to the body of the box so the contents remain inside.
4. Bring the cardboard lab glass box down to your building’s red lidded carts and place inside. Then lock the cart.
   - If you are using the 32gal. cart to house the cardboard glass box, roll the cart down to the dumpster corral and leave for pick-up. Carts are serviced on Saturdays.

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**Lab Waste Management Program – Sharps Disposal Flowchart**

- **Sharps Containers**
  - Small Generators → EH&S → Medical Waste Management Company → Landfill
  - Large Generators → Medical Waste Management Company → Landfill

- **Cardboard Lab Glass Boxes**
  - Carts serviced by MarBorg on Saturdays → Landfill

Questions? Contact Bruce Carter 893-3293 or Matthew O’Carroll 893-2661, x2302
SCIENCE BUILDINGS: PRIMARY EMERGENCY ASSEMBLY POINTS

In the event of a building evacuation due to fire, earthquake, etc., building occupants should meet and stay at the locations below. This will facilitate the collection and distribution of information for emergency responders. In the event these areas are impacted by an emergency, an alternative site will be identified at the time.

Aquarium Facility, Building #465: North to Parking Lot #6

Bioengineering Building #512: South of building

Biology Instructional Facility (Biology 3), Building #504: Lawn in front of Anacapa Hall (south of building)

Biology 2, Building #571: Lawn area in front of Anacapa Hall (south of building)

Biology Research Facility, Building #569: Lawn area in front of Anacapa Hall (south of bldg.)

Biological Sciences Annex, Building #539: Lawn area in front of Anacapa Hall (south of bldg.)

Broida Hall, Building #572: Lawn area (north of building)

Bren School, Building #521: East of building, south of Eng. I on grass

California Nano Science Institute (Eling Hall), Building #266: south of building to Inst. of Theoretical Physics grass

Chemistry, Building #557: Lawn (south of building)

Engineering 2, Building #503: West of bldg., 100 ft. minimum from bldg.

Engineering Science Building, Building #225: Southwest of bldg., south of Chemistry lecture halls

Environmental Health & Safety, Building #565: Lot 17 (east of building)

Geology (Webb Hall), Building #526: Lot 7 (west of building)

Greenhouse, Buildings #540 and 539: Lot 1 (east of building)

Howard Frank Hall (Engineering 1), Building #556: South of building (lawn under the tree)

Life Sciences Building, Building #235: Lawn area in front of Anacapa Hall (south of building)

Marine Biotechnology Laboratory, Building #555: Lot 6 (north of building)

Marine Science Research Lab (MSRL), Building #520: West to Lot 1

Materials Research Lab, Building #615: North of building across road

Noble Hall, Building #544: Across UCEN road to grass of Anacapa Hall (south)

Physical Sciences Building South, Building #672: Lawn area (north of building)

Physical Sciences Building North, Building #657 lawn (south of building)

Preston Cloud Research, Building #575: Courtyard in front of Broida (north of building)

Psychology, Buildings #551 & 411 & 429 & 251: Grass area between lecture halls and Library (north)

Woodhouse Laboratory, Building #546: Courtyard in front of building (north of building)