

STANDARD OPEARTING PROCEDURE FOR ACUTE TOXICANTS



USC University of
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NATURE OF HAZARD

Acute toxicants are substances capable of causing death in humans following a single exposure of sufficient magnitude, or injury/illness after absorption of a smaller dose. The potency of acute toxicants is assessed using animal testing. Please refer to Section 6 of the CHP for details of the identification and hazard classification of acute toxicants, and the relationship between potency and classification. All personnel who agree to abide by this SOP are required to familiarize themselves with the contents of Section 6 of the [CHP](#).

Acute toxicants may act on the body by all routes of exposure (absorption through skin/eyes/mucous membranes, injection under skin, ingestion, inhalation as dust, droplets, or vapor). Certain toxicants may have a particular propensity to be absorbed and act through certain routes, which will be reflected in the hazard classification and hazard statements found in safety data sheets (SDSs).

Some toxic materials may also have a corrosive effect through damage or death to cells at the point of application. All potential hazardous properties should be taken into consideration when planning for safe hazardous materials usage.

All toxic materials should be considered as hazardous to eyes.

PARTICULARLY HAZARDOUS SUBSTANCES (PHS)

- Highly acutely toxic materials fall under the Cal-OSHA definition of Particularly Hazardous Substances (PHS) which require additional precautions in use ([8 CCR §5191](#)). Please refer to the [Chemical Hygiene Plan](#) (CHP; Sections 6 and 8) for more information on the classification and identification of PHS, and safe practices for working with these materials.

HAZARD IDENTIFICATION

- For purchased chemicals, identification as acutely toxic should be made based on hazard information given in the safety data sheet (SDS). Furthermore, to determine if the chemical is also classified as PHS, the information in the SDS should also be assessed against the criteria given in the CHP subsection Particularly Hazardous Substances (towards the end of Section 6).
- For synthesized chemicals, please refer to CHP subsection Particularly Hazardous Substances for pointers as to when significant acute toxicity may be suspected or assumed. In general, all substances of untested toxicity shall be assumed acutely toxic where there is any degree of suspicion that they might be toxic based on chemical reactivity (e.g. strong alkylating agents), chemical analogies to known toxic substances (e.g. organophosphates), presence of atoms of elements generally associated with toxicity (e.g. heavy metals, fluorine (except inert perfluorocarbons)), and/or presence of anions generally associated with toxicity (e.g. azide, cyanide, selenite, selenate).
- Substances designed to bind to bioreceptors, inhibit enzymes, or open or close ion channels shall be considered toxic.

PREPARATION

- Do not handle Acute Toxicants while working alone in the cleanroom area.
- Remove hand and wrist jewelry. Do not wear contact lens (Contact lens are not permitted in the cleanroom).
- Identify the locations of safety equipment (Eyewash and Shower station, Hazardous Waste Container, Emergency buttons and Phones).
- Save DPS emergency line 213-740-4321 into personal phone.
- Read the Safety Guideline and Material Safety Data Sheet for specific Acute Toxicants
- Wear all appropriate PPE (Safety Goggles, Face Shield for operations with splash hazard, Two layers of gloves).
- Ensure an adequate supply of clean-up material is within reach in case of spills.
- Ensure an appropriate waste container is accessible to dispose contaminated clean-up material.
- For more hazardous work involving acute toxicants, restrict access to work area with sign labelled "Warning - Toxic".
- Use only the minimal amounts of Acute Toxicant. Acute Toxicants must be handled under a fume hood.
- Clearly label all containers with any liquids, including containers with water. Place containers with Acute Toxicants into secondary polypropylene container while not in use.
- Labels must include User Name, Group (PI) Name, Contact Email or Phone Number, Chemical Name, and Chemical Formula.

WASTE DISPOSAL

- Wash all beakers and cylinders used in handling.
- Wipe down and dry all surfaces.
- Store waste in containers labelled "CHEMICAL/HAZARDOUS WASTE FOR DISPOSAL."

SKIN AND EYE EXPOSURE

- For skin exposure, immediately flush with cool water for a minimum of 15 minutes. Remove contaminated clothing and footwear while rinsing.
- For eye exposure, forcibly hold eyes open and flush for at least 15 minutes. Continue flushing area with water if pain continues.
- Do not use neutralizing chemicals, creams, abrasives, or lotions.
- Contact DPS and alert cleanroom staff.

INHALATION EXPOSURE

- Move to location with fresh air.
- Obtain medical attention immediately if symptoms develop (coughing, shortness of breath, wheezing, burning in mouth or throat, or chest pain).
- Alert cleanroom staff and call DPS for medical assistance.

INGESTION

- Alert cleanroom staff and call DPS for medical assistance.
- If possible, determine what material was ingested by victim.
- If victim begins to vomit, turn head or entire body to one side to avoid choking.
- Do not induce the victim to vomit or drink any beverage unless instructed to by qualified medical personnel.

ACCIDENTAL SPILLS

- Minor spills can be cleaned with a spill kit or simple items like wipes or absorbent pads.
- For all spill emergencies, contact DPS and alert cleanroom staff.
- Evacuate personnel from spill area and deny entry.

UNATTENDED EXPERIMENTS

- Chemicals may not be left unattended for more than 15 minutes.
- For unattended experiments longer than 15 minutes, notify cleanroom staff to get permission.
- The maximum time for unattended chemicals is one hour.
- Unattended chemicals require displayed signage at fume hood.
- The sign must contain the hazards of the experiment, the experimenter's name and contact information, responsible PI's name and contact information, expected date and time of disposal.
- For more information on unattended hazardous experiments, please refer to the [Unattended Hazardous Operations Fact Sheet](#).

EMERGENCY NOTIFICATION

- Notify the Department of Public Safety (DPS) at (213) 740-4321 or (323) 442-1000. For a non-emergency, dial (213) 740-6000.
- State the nature of the emergency (e.g., injury, hazardous materials or biohazards spill, fire) and provide details.
 - a) Location of injury/incident
 - b) Name(s) of injured and name(s) of witness(es)
 - c) Contact information (your name and call-back number)
 - d) Injury/incident summary
- Notify EH&S immediately at (323) 442-2200 or injuryprevention@usc.edu to report the injury/incident.
- Notify the cleanroom staff and your supervisor.

EXAMPLES OF ACUTE TOXICANTS

Acrolein, hydrogen cyanide, osmium tetroxide, arsine, hydrogen fluoride, ozone, chlorine, methyl fluorosulfonate, phosgene, diazomethane, nickel carbonyl, sodium azide, diborane (gas), nitrogen dioxide, sodium cyanide

References

- [SOP – Acute Toxicants | USC Environmental Health & Safety](#)
- [Chemical Hygiene Plan](#)

Contributors	Revised Date
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