

# STANDARD OPEARTING PROCEDURE FOR CHLORINATED SOLVENTS



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## GENERAL

Chlorinated solvents, also known as organochlorines, are Volatile Organic Compounds (VOCs) containing at least one chlorine atom. The solvents evaporate quickly and continuously at room temperature if not kept in a closed container.

## TOXICOLOGY

- Chlorinated solvents (chlorobenzene, trichloroethylene) are among the most harmful of VOCs and have detrimental effect on human body causing organ damage or cancer.

## HAZARD IDENTIFICATION

- Two commonly used chlorinated solvents are Chlorobenzene and Trichloroethene.
- The hazard classification for Chlorobenzene is as follows:
  - Flammable liquids (Category 3)
  - Acute Inhalation Toxicity – Vapors (Category 4)
  - Skin Corrosion/Irritation (Category 2)
- The hazard classification for Trichloroethene is as follows:
  - Skin Corrosion/Irritation (Category 2)
  - Serious Eye Damage/Eye Irritation (Category 2)
  - Skin Sensitization (Category 1)
  - Germ Cell Mutagenicity (Category 2)
  - Carcinogenicity (Category 1A)
  - Specific target organ toxicity (single exposure) (Category 3)
  - Target Organs – Central nervous system (CNS)
  - Specific target organ toxicity (repeated exposure) (Category 2)
  - Target Organs – Kidney, Liver, Heart, Spleen, Blood

## PREPARATION

- Do not handle Chlorinated Solvents 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 Chlorinated Solvent.
- 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.
- Restrict access to work area with sign labelled "Warning - Toxic".
- Use only the minimal amounts of Chlorinated Solvent. Chlorinated Solvent must be handled under a fume hood.

- Clearly label all containers with any liquids, including containers with water. Place containers with Chlorinated Solvent 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](mailto:injuryprevention@usc.edu) to report the injury/incident.
- Notify the cleanroom staff and your supervisor.

## EXAMPLES OF CHLORINATED SOLVENTS

Chlorinated Methanes, Chlorinated Ethanes, Chlorinated Ethenes, Chlorobenzene

References

- [Chemical Hygiene Plan](#)

Contributors	Revised Date
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