Standard Operating Procedure

**Carbon tetrachloride**

*This is an SOP template and is not complete until: 1) lab specific information is entered into the box below 2) lab specific protocol/procedure is added to the protocol/procedure section and   
3) SOP has been signed and dated by the PI and relevant lab personnel.*

Print a copy and insert into your   
*Laboratory Safety Manual* and *Chemical Hygiene Plan*.   
Refer to instructions for assistance.

|  |  |
| --- | --- |
| **Department:** | Click here to enter text. |
| **Date SOP was written:** | Click here to enter a date. |
| **Date SOP was approved by PI/lab supervisor:** | Click here to enter a date. |
| **Principal Investigator:** | Click here to enter text. |
| **Internal Lab Safety Coordinator/Lab Manager:** | Click here to enter text. |
| **Lab Phone:** | Click here to enter text. |
| **Office Phone:** | Click here to enter text. |
| **Emergency Contact:** | Click here to enter text. |
| *(Name and Phone Number)* |
| **Location(s) covered by this SOP:** | Click here to enter text. |
| *(Building/Room Number)* |

**Type of SOP:**  Process Hazardous Chemical  Hazardous Class

**Purpose**

Carbon tetrachloride is a select carcinogen. It is used as a solvent in synthetic chemistry and also in NMR spectroscopy.

**Physical & Chemical Properties/Definition of Chemical Group**

CAS#: 56-23-5

Class: **Select carcinogen, toxic**

Molecular Formula: CCl4

Form (physical state): Liquid

Color: N/A

Boiling point: 76 - 77 °C

**Potential Hazards/Toxicity**

**Emergency Overview**

**OSHA Hazards**

Carcinogen, Target Organ Effect, Toxic by inhalation, Toxic by ingestion, Toxic by skin absorption

**Target Organs**

Liver, Kidney, Eyes, Nerves & Heart.

Pictogram

 

**Potential Health Effects**

**Inhalation** Toxic if inhaled. May cause respiratory tract irritation.

**Skin** Toxic if absorbed through skin. May cause skin irritation.

**Eyes** May cause eye irritation.

**Ingestion** Toxic if swallowed.

**Signs and Symptoms of Exposure**

* Vomiting, Diarrhea, Abdominal pain, Nausea, Dizziness, Headache, Damage to the eyes, Liver injury may occur, Kidney injury may occur.
* Exposure to and/or consumption of alcohol may increase toxic effects.
* Contact with skin can cause Pain, Erythema, hyperemia

**NOTE:** Exposure to high concentrations of carbon tetrachloride (including vapor) can affect the Central Nervous System – CNS, degenerate the liver and kidneys and may result (after prolonged exposure) in coma and even death. Chronic exposure to carbon tetrachloride can cause liver and kidney damage and could result in cancer.

**Personal Protective Equipment (PPE)**

**Respirator Protection**

Respirators should be used only under any of the following circumstances:

* As a last line of defense (i.e., after engineering and administrative controls have been exhausted).
* When Permissible Exposure Limit (PEL) has exceeded or when there is a possibility that PEL will be exceeded.
* Regulations require the use of a respirator.
* An employer requires the use of a respirator.
* There is potential for harmful exposure due to an atmospheric contaminant (in the absence of PEL)
* As PPE in the event of a chemical spill clean-up process

Lab personnel intending to use/wear a respirator mask must be trained and fit-tested by ORS and should contact occhealt@uga.edu. This is a UGA requirement described in more detail in the [UGA Respiratory Protection Plan](https://esd.uga.edu/sites/default/files/respiratoryprotection.pdf) and supported by the [Office of Research Occupational Health and Safety Program](https://research.uga.edu/ohsp/).

**Hand Protection**

Handle with ***Nitrile*** or *Supported PolyVinyl Alcohol (PVA).*

Gloves must be inspected prior to use.

Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with Carbon tetrachloride.

Wash and dry hands.

NOTE: Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with carbon tetrachloride.

Refer to glove selection chart from the links below:

<http://www.ansellpro.com/download/Ansell_8thEditionChemicalResistanceGuide.pdf>

OR

<http://www.allsafetyproducts.biz/page/74172>

OR

<http://www.showabestglove.com/site/default.aspx>

OR

<http://www.mapaglove.com/>

**Eye Protection**

Safety glasses or Safety goggles (ANSI approved).

**Skin and Body Protection**

Lab coat

Full length pants or equivalent

Close toed shoes

**Hygiene Measures**

Avoid contact with skin, eyes and clothing.

Wash hands before breaks and immediately after handling Carbon tetrachloride.

**Engineering Controls**

All operations involving Carbon tetrachloride must be carried out in a certified chemical fume hood.

Chemical fume hoods used as containment areas for Particularly Hazardous Substances (Select Carcinogens, Regulated Carcinogens, Reproductive Toxins and Acute Toxins) must have a face velocity of 100 ft/min averaged over the face of the fume hood.

Laboratory rooms must be at negative pressure with respect to the corridors and external environment. To achieve this, the laboratory/room door must be kept closed at all times.

**First Aid Procedures**

**If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**

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.

**If swallowed**

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**Special Handling and Storage Requirements**

**Precautions for safe handling**

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist.

**Conditions for safe storage**

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

* All Carbon tetrachloride containers must be stored using secondary container (tray/tub) with proper signage/caution label.
* Hazard communication: Warning/Caution label is required on each Carbon tetrachloride container, secondary containment and designated storage cabinets. Warning/Caution label must state the following:

“CARCINOGEN or CANCER HAZARD or SUSPECT CANCER AGENT”

**Spill and Accident Procedure**

**Chemical Spill Dial 911**

**24-7 On-Call Response to Research, Environment, Health or Safety Concerns Dial 2-5561 from a campus phone or 706-542-5561 from a non-campus line.**

**Spill** – Follow the procedures set out in the [UGA Chemical and Laboratory Safety Manual.](http://research.uga.edu/docs/units/safety/manuals/Chemical-Laboratory-Safety-Manual.pdf)

[If there are any chemical-specific protocols for responding to a spill, insert them here or mark “none”:]

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# **Medical Emergency Dial 911**

**Life Threatening Emergency, After Hours, Weekends And Holidays** – Dial **911** or the emergency phone numbers listed at the beginning of the UGA Chemical and Laboratory Safety Manual

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Non-Life Threatening Emergency** – Follow the instructions in the UGA Chemical and Laboratory Safety Manual.

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Decontamination/Waste Disposal Procedure**

**For general hazardous waste disposal procedures, see Appendix H of the UGA Chemical and Laboratory Safety Manual.**

**Chemical Specific Procedures: [to be inserted or marked as “none”]**

Laboratory work surfaces and equipment shall be decontaminated at the conclusion of each procedure and at the end of each day.

**Safety Data Sheet (SDS) Location**

UGA personnel can access Online SDS through a link in the upper left corner of the ESD home page (<https://esd.uga.edu>) and logging in by using their UGA email user name and password.

**Protocol/Procedure (Add lab specific Protocol/Procedure here)**

Click here to enter text.

**NOTE**

Any deviation from this SOP requires approval from PI.

**Documentation of Training** (signature of all users is required)

* Prior to conducting any work with carbon tetrachloride, designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and access to the SDS provided by the manufacturer.
* The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last 12 months.

I have read and understand the content of this SOP:

|  |  |  |
| --- | --- | --- |
| **Name** | **Signature** | **Date** |
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