



Carcinogens

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A carcinogen is a substance or agent that can cause cancer by interacting with a cell's DNA to produce mutations. It is important to identify these substances in order to avoid or limit our exposure to them.

OSHA defines a select carcinogen as a substance that meets any one of the following criteria:

- i. It is regulated by OSHA as a carcinogen.
- ii. It is listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program (NTP).
- iii. It is listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on Cancer Monographs (IARC).
- iv. It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria.
 - A. After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m^3 ;
 - B. After repeated skin application of less than 300 (mg/kg of body weight) per week; or
 - C. After oral dosages of less than 50 mg/kg of body weight per day.



Personal Protective Equipment & Personnel Monitoring



Lab Coat

Standard lab coats are required. Flame resistant lab coats should be considered when handling flammable carcinogens and other hazardous materials that are easily ignited.



Gloves

Nitrile or neoprene gloves typically provide adequate protection against minor splashes. Consult with your PI or supervisor to determine whether any materials involved in your process require alternative hand protection.



Eye Protection

ANSI Z87.1 - Compliant safety glasses or safety goggles if a splash hazard is present.

Labeling, Storage & Handling

Store upright & tightly closed away from materials that are not particularly hazardous or which may be incompatible. Each container holding one of these items shall comply with OSHA/GHS regulations. It is recommended that storage locations holding these items be labeled as a storage location for carcinogens to avoid an accidental encounter.

Chemicals that meet the criteria of a carcinogen as described above are classified as Particularly Hazardous Substances (PHSs) and should be handled using the following suggested practices:

- Keep quantities at a minimum working level
- Label storage areas with appropriate warning signs (e.g., Caution, Carcinogen Storage)
- Limit access to storage areas
- Carefully manage your inventory of these substances using Chematix.
- Wash hands and equipment thoroughly after each use
- Protective clothing worn while using the material should not be worn outside of the lab.

Engineering Controls, Equipment & Materials

Fume Hood It is advisable to use a fume hood when working with these materials. If the use of a fume hood is impossible or impractical, please contact the Office of Research Safety (ORS) to determine whether additional respiratory protection is required.

Cautions and Considerations

Since OSHA considers carcinogens to be particularly hazardous substances, laboratories must provide additional information regarding staff and student protection. This information must include the following:

- Establishment of a designated area for the use of such items
- Use of containment devices such as fume hoods or glove boxes
- Procedures for safe disposal of contaminated waste
- Decontamination procedure

Housekeeping

Spills Notify others in the area of the spill, including your supervisor. Laboratory personnel should refer to the Spill Control Guidelines for additional information. Have a plan, proper equipment, and materials ready to minimize exposure if an accident occurs.

Decontamination Decontamination methods vary based on the materials handled and equipment being used. Please review the chemical Safety Data Sheet for guidance on cleaning surfaces and equipment used with these substances.

Any waste from this chemical class should be disposed of through the UGA Hazardous Waste Program. For assistance with arranging a waste pickup, you may contact the Environmental Safety Division (ESD) at 706-542-5801. Prior to pickup, any container used to hold hazardous waste should be labeled with the following:

Waste

- “Hazardous Waste”
- Chemical contents: Enough detail should be provided so that the full contents of the container are readily apparent. Labeling may include any of the following:
 - Percentages (Ex: 70% water, 30% hydrochloric acid)
 - Volumes (Ex: 1L of acetone, 500mL of water)
 - Chemical classes (Ex: halogenated solvents)
 - Method (Ex: EPA 515.1 Herbicide Extraction Solvent Waste)
 - Referenced Log (Ex: See Laboratory Waste Log, Volume 2)
 - Utilizing Chematix waste profiles
 - Any other labeling method providing enough detail to accomplish this requirement
- One or more of the following waste characteristics recognized by EPA: Ignitable, Corrosive, Reactive, or Toxic.

First Aid & Emergencies	
Fire	Use a dry chemical or CO ₂ extinguisher (ABC or BC) to put out a small fire.
Skin Eye Contact	Remove contaminated clothing and accessories; flush affected area with water. Seek medical attention.
Inhalation	Move person into fresh air. Seek medical attention.
Ingestion	Rinse mouth with water. Seek get medical attention.

Contacts

Office of Research Safety: 706-542-5288
Environmental Safety Division: 706-542-5801

References

Carcinogen, National Human Genome Research Institute, 2022

1910.1450 - Occupational Exposure to Hazardous Chemicals in Labs, United States Department of Labor—Occupational Safety and Health Administration, 2012

SOP: Carcinogens, UPenn EHRS, 2022

Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards, National Academy Press, Washington, DC, 2011