Research Safety
Office of Research
UNIVERSITY OF GEORGIA

Reproductive Toxin/Germ Cell Mutagen/Teratogens
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OSHA defines reproductive toxins as chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses. This definition is comprehensive and incorporates toxic effects on all elements of the process of reproduction, including damage to the germ cells of both males and females (sperm and ova). Women who are pregnant or may become pregnant should consult with a physician before handling any chemicals which fall into this category. Exposure routes can be oral, dermal, or via inhalation.

There are three GHS hazard criteria categories for germ cell mutagenicity:
Category 1A: Chemicals known to or regarded as if they induce heritable mutations in human germ cells.

- Positive evidence from human epidemiological studies.

Category 1B: Chemicals known to or regarded as if they induce heritable mutations in human germ cells.

- Positive result(s) from in vivo heritable germ cell mutagenicity tests in mammals; or
- Positive result(s) from in vivo somatic cell mutagenicity tests in mammals, in combination with some evidence that the substance has potential to cause mutations to germ cells. This supporting evidence may, for example, be derived from mutagenicity/genotoxic tests in germ cells in vivo, or by demonstrating the ability of the substance or its metabolite(s) to interact with the genetic material of germ cells; or
- Positive results from tests showing mutagenic effects in the germ cells of humans, without demonstration of transmission to progeny; for example, an increase in the frequency of aneuploidy in sperm cells of exposed people.

Category 2: Chemicals that may induce heritable mutations in human germ cells.

- Positive evidence obtained from experiments in mammals and/or in some cases from in vitro experiments, obtained from:
  -Somatic cell mutagenicity tests in vivo, in mammals; or
  -Other in vivo somatic cell genotoxicity tests which are to be supported by positive results from in vitro mutagenicity assays.

Personal Protective Equipment & Personnel Monitoring

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

Double 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.

ANSI Z87.1 - Compliant safety glasses or safety goggles if a splash hazard is present. A face shield is also recommended when working with large amounts of reproductive toxins and/or when pouring.

Labeling & Storage

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 reproductive toxins to avoid an accidental encounter.

Chemicals that meet the criteria of a reproductive toxin 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, Reproductive Toxins)
- 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 & Considerations

Since OSHA considers reproductive toxins to be particularly hazardous substances, laboratories must provide additional information regarding staff and student protection. Women who are pregnant or may become pregnant should consult with a physician before handling any chemicals which fall into this category.
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 or contaminated waste
- Decontamination procedure

Housekeeping

Spills	Notify others in the area of the spill, including your supervisor. Remove sources of ignition if possible. 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.

Waste	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: - "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 medical attention.

Contacts

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

References

OSHA Occupational Exposure to Hazardous Chemicals in Laboratories

OSHA A Guide to the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

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

Reproductive Toxins, Cornell University