



LABORATORY SAFETY GUIDELINE

Benzene [CAS No. 71-43-2]

All users of benzene must review this document before use. Benzene is a clear, colorless, highly flammable and volatile, liquid aromatic hydrocarbon with a gasoline-like odor. Benzene is found in crude oils and as a by-product of oil-refining processes. In industry, benzene is used as a solvent, as a chemical intermediate, and is used in the synthesis of numerous chemicals. Formerly used frequently as a reaction solvent, its use has decreased in recent years in favor of less hazardous options such as toluene. Users should contact their EHS Laboratory Safety Advisor and department safety officer if they have questions before beginning work.

HAZARDS

	Highly flammable liquid and vapor.
	Fatal if swallowed or enters airways. May cause genetic defects and/or cancer. Causes damage to organs through prolonged or repeated exposure.
	Can cause skin irritation or serious eye irritation

Exposure to this substance causes neurological symptoms and affects the bone marrow causing aplastic anemia, excessive bleeding and damage to the immune system. Benzene is a known human carcinogen and is linked to an increased risk of developing lymphatic and hematopoietic cancers, acute myelogenous leukemia, as well as chronic lymphocytic leukemia.

PRECAUTIONS

Before starting work:

- Determine if you can use a less hazardous substance in place of benzene;
- Review manufacturer's Safety Data Sheet and additional chemical information at ehs.harvard.edu/safety-data-sheets-sds;
- Ensure that a written experimental protocol including safety information is available;
- Be familiar with general University emergency procedures in the [EHS Lab Emergency Response Guide](#);
- Order the most dilute solutions available that will meet experimental needs. Order only the quantity that you need;
- Identify the location of the nearest eyewash and emergency shower and verify that they are accessible;
- Locate and verify that appropriate spill cleanup materials are available, including the following:
 - Spill-X-S or Absorbent pads/vermiculite
- Ensure another person who knows emergency procedures is in the area.

During work:

- AVOID INHALATION! Perform all operations in a certified chemical fume hood or other approved ventilated enclosure. Sash lowered as much as possible. Always work at least 6 inches into the fume hood and behind the sash;
- AVOID CONTACT! Use appropriate personal protective equipment (PPE):
 - Wear a lab coat (preferably flame resistant or retardant lab coat), a garment covering to the ankles, and closed-toed shoes;
 - Safety goggles
 - Poly vinyl alcohol, Butyl or fluorinated rubber recommended. Nitrile gloves are not recommended with this chemical since it provides only a few minutes of splash protection and not protective for longer-term contact.
 - Always consult Safety Data Sheet to ensure proper glove selection
 - Gloves must be thoroughly inspected prior to each use. Do not use damaged gloves;
 - Change gloves whenever you suspect they have become contaminated;
 - Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact;
 - Wash hands and forearms thoroughly with soap and water each time gloves are removed;

- Use materials and containers appropriate for benzene use and remain aware of potential incompatibilities; Benzene is incompatible with Acids, Bases, Halogens, Strong oxidizing agents, Metallic salts
- Keep all containers tightly closed when not in use and during transport. It is recommended to use metal safety cans or glass bottles.

After completing the work:

- Dispose of benzene waste following Harvard University [Hazardous Waste Procedures](#)
 - Hazardous Waste Classification: Ignitable/Flammable and Toxic/Poison
 - Benzene is a P-listed waste anything to do with the process (solution in any dilution, gloves, and pipette tips) must be disposed of as a hazardous waste
 - Please set up both a solid and liquid waste stream in your SAA for this chemical.
 - Chemical container for this waste stream must remain sealed.
- Return container to storage area following Harvard University [Laboratory Chemical Storage Guide](#)
 - Storage Group: Flammable Liquids (FL)
 - Store in original containers or other appropriate containers;
 - Store primary container in designated and compatible secondary containers;
 - Store away from incompatibles;
- Wash hands and forearms thoroughly with soap and water before leaving the lab.

EMERGENCY PROCEDURES

First Aid

SKIN CONTACT

- Wash with plenty of tepid water for at least 15 minutes using the closest available sink, safety shower or drench hose. Remove any exposed clothing as well as any jewelry.
- Seek medical attention; call 911 on a landline phone for medical assistance (or provide location if calling on a mobile phone).

EYE CONTACT

- Using eyewash, flush eyes while holding eyelids open;
- Seek medical attention; call 911 on a landline phone for medical assistance (or provide location if calling on a mobile phone).

INHALATION

- Move to fresh air;
- Seek medical attention; call 911 on a landline phone for medical assistance (or provide location if calling on a mobile phone).

INGESTION

- Do not induce vomiting. Volatile chemicals have a high risk of being aspirated into the victim's lungs during vomiting;
- Never give anything by mouth to an unconscious person;
- Seek medical attention; call 911 on a landline phone for medical assistance (or provide location if calling on a mobile phone).

Spill Response

OUTSIDE FUME HOOD OR VENTILATED ENCLOSURE

- Alert others and evacuate to a safe distance and prevent entry.
- Contact the University Operations Center at (617) 495-5560 [HMS/HSDM (617) 432-1901]
- Remain in a safe location until EH&S or other response personnel arrive.

INSIDE FUME HOOD OR VENTILATED ENCLOSURE (< 500 ml)

- If trained and confident, you may assist in the clean-up effort of small amounts, wearing PPE described above and using appropriate spill supplies.
 - Cover the spill with absorbent material and wait until all liquid is absorbed
 - Collect debris in appropriate container and move to your Satellite Accumulation Area. Label with appropriately completed hazardous waste tag and request a waste pickup.
- Otherwise close the fume hood sash and await support.
- Contact the University Operations Center at (617) 495-5560 [HMS/HSDM (617) 432-1901] if you need support or technical assistance.