

BENZENE

Scope

This document outlines the controls to be used for low-risk use of benzene (in its liquid form). In this context, low-risk use is defined as:

- Any quantity of benzene used in a fumehood or less than 50 mL of benzene used outside of a fumehood. The process also **must not** lead to the formation of vapours (e.g., heating, violent chemical reactions).

All other processes require that a [Designated Substance Assessment](#) is completed in conjunction with the Safety Office, as well as a standard operating procedure (SOP) that is approved by the supervisor, communicated to workers, and available in the lab.

Hazard Description

Benzene is a clear, sometimes yellowed liquid with an aromatic odour. Benzene is classified as a [designated substance](#) (Occupational Health and Safety Act, R.S.O. 1990, c. O.1, O. Reg. 490/09) due to its ability to cause severe health impairments as a result of exposure. Some hazards pertaining to benzene include:

- The possibility to cause cancer and/or genetic defects.
- Life-threatening if ingested or inhaled.
- Damaging to blood over repeated exposure.
- Extremely flammable liquid and vapour.

Prior to Working with Benzene

- Complete all mandatory training (refer to [Chemical Safety Program](#) and your project risk assessment).
- Complete a [research-specific laboratory risk assessment](#) to evaluate risk.
- Confirm that benzene cannot be substituted for a safer substance. For example, cyclohexane can be used as a substitute solvent to benzene in some applications.
- Storage and use of benzene requires the completion of the [Designated Substance Form](#).
- Review any relevant SOPs for the equipment or techniques that may be performed with benzene.
- Ensure that workers are aware of this document and post it in the lab space.
- Ensure that all required materials are available [in case of a spill](#), emergency exposures, and for waste collection.
 - Remove sources of ignition from the immediate area due to benzene's flammability.

Handling

- Prioritize handling benzene in a fumehood to avoid inhaling vapours. Where fumehood use is not possible, small quantities (less than 50 mL) can be used in a well-ventilated room.
- Wear personal protective equipment as outlined in your laboratory risk assessment. Personal protective equipment should include at a minimum suitable gloves, chemical safety goggles, a lab coat, and close-toed boots. [CCOHS-recommended](#) gloves for handling benzene are *Viton®*, *AlphaTec® (O2-100, 4000, EVO, VPS)*, and *Silver Shield® - PE/EVAL/PE*. Nitrile gloves may only be worn when risk of contamination or splash is very low and must be replaced the moment any benzene splashes on them.
- **Benzene must never be mixed with strong oxidizers** (e.g., peroxides, chlorine) as doing so may cause an explosion.

Emergency Procedures

Always review the SDS of the purchased product for manufacturer-specific recommendations. Look at SDS for other modes of exposure.

Contacts	
Emergency: 911 UW Special Constables: 519-888-4911 or ext. 22222 Poison Control: 1-800-268-9017	
Whenever 911 is called, if possible, UW Special Constables should also be informed to make them aware of the emergency on campus and allow them to support as needed. Ask them to meet the paramedics and direct them to the incident location.	
Inhalation	<ul style="list-style-type: none">▪ Ensure you are wearing the appropriate PPE before helping the victim▪ Move the victim into fresh air▪ Call 911 for medical attention, if necessary
Skin Contact	<ul style="list-style-type: none">▪ Immediately remove contaminated clothing▪ Rinse skin with water and shower, if necessary▪ Consult a physician
Eye Contact	<ul style="list-style-type: none">▪ Rinse adequately with water▪ Call in an ophthalmologist▪ Remove contact lenses, if applicable

Storage

Benzene is in [Storage Group L – Non-Reactive Flammables and Other Combustibles](#). Store benzene in a cool, dry, and well-ventilated location in a tightly shut container. It should be away from direct sunlight and heat, preferably in a flammable cabinet away from incompatible materials (i.e., strong oxidizers).

Hazardous Waste

- Must be disposed of as per the [University's Hazardous Waste Standard](#).
- Benzene waste should only be mixed with other organic solvents. This organic solvent waste should then safely be disposed through the ESF.