



Ethidium Bromide Fact Sheet
Western Connecticut State University
Procedure for Management and Disposal of Ethidium Bromide

General Information

Ethidium Bromide (EtBr) is a commonly used stain for the visualization of nucleic acids in agarose gels. While it is not specifically listed as a hazardous waste, its mutagenic properties cause it to be regulated as a hazardous waste and may present a hazard if it is not managed properly in the laboratory.

Personal Protection With EtBr and Ultraviolet (UV) Use

When handling EtBr, always wear a lab coat, nitrile gloves, and chemical splash goggles. Additional skin and UV eye protection are required when using an ultraviolet light source concurrently with EtBr. Goggles must provide UV protection. If the UV light source is facing upward, a face shield should be used instead of goggles; the face shield must also provide UV protection. Avoid exposing unprotected skin to intense UV sources. Wrap up lab coat sleeves with tape or other means where the skin/wrist could be exposed.

Spill Cleanup:

In case of a small spill, absorb freestanding liquid. Use ultra violet light to locate the spill.

Spill Cleanup / Decontamination / Solution Prep ¹

- De-energize all electrical equipment before decontaminating; wear appropriate protective equipment, including gloves, lab coat, and safety goggles.
- Absorb all free liquid from the spill with paper towels.
- Scrub the contaminated surface six separate times, each time using a fresh, wet paper towel. Place all paper towels into an appropriate waste container.
- In a chemical fume hood, dissolve 4.2 grams of sodium nitrite in 300 ml of water and then add 20 ml hypophosphorous acid (50%). Stir briefly to ensure mixing. The pH of the mixture should be around 1.8.
- Pour the freshly made solution over the paper towels used during the clean up and on flat surfaces and allow to soak for at least one hour.
- Test the used decontamination solution, flat surfaces, and clean up debris by fluorescence spectrophotometry.
- Check pH, adjust with sodium bicarbonate to between 5 and 9. Dry equipment and surfaces and return to service.

¹ Lunn, George, and Sansone, E.B., 1994, Destruction of Hazardous Chemicals in the Laboratory, John Wiley & Sons, Inc., pp 183-190

In case of a larger spill, evacuate the laboratory immediately. Call University Police at 911, who will contact Environmental Health & Safety (EH&S) for assistance with a clean up. Prevent unnecessary entry into the room until the EH&S personnel arrive. Explain all the details to the EH&S personnel.

Disposal of EtBr

Electrophoresis Gels

Gels containing more than 0.1% EtBr are to be placed in an appropriate container for hazardous waste disposal, in accordance with University Waste Management Guidelines. EH&S has a variety of containers that are available to collect and dispose of gels of different sizes.

Aqueous and Non-Aqueous Solutions

All solutions of EtBr are to be placed in an appropriate container for hazardous waste disposal in accordance with University Waste Management Guidelines.

Crystals and Powders

Label containers containing crystals and powders as “hazardous waste.” All containers of EtBr are to be collected, labeled, and disposed of in accordance with University Waste Management Guidelines.

Contaminated Labware

There are two categories of contaminated labware:

1. Grossly contaminated – visible contamination with liquid droplets or dry residue.
2. Incidentally contaminated – no visible contamination, but has been in contact with powders or liquids.

Grossly contaminated labware is to be cleaned with the decontamination solution if it is intended to be reused or disposed of as hazardous waste.

Incidentally contaminated labware can be thrown out as regular trash.

Examples:

- Needles, scalpels, and pasture pipettes are to be disposed of as sharps wastes
- Volumetric / transfer pipettes, test tubes / centrifuge tubes **incidentally contaminated** can be disposed of as regular trash. If they are **grossly contaminated**, they need to be washed with the decontamination solution prior to disposal.
- Gloves, bench paper, and all other non-labware items incidentally contaminated can be disposed of as regular trash.
- All rinse solutions, wash solutions, and decontamination byproducts are to be disposed of as hazardous waste in accordance with Waste Management Guidelines.

Accident Procedures

Call University Police at 911 to report spills. Listed below are procedures to follow in case of contact with solutions or powders:

- In the case of eye contact, flush eye(s) with water for at least 15 minutes, lifting upper and lower eyelids occasionally.
- If skin is exposed, remove contaminated clothing and wash skin with soap and water immediately.
- If EtBr vapors are inhaled, remove to fresh air.
- If swallowed, get medical attention immediately and call 911

Contaminated Equipment

Laboratory equipment (e.g., transilluminators, laboratory floors and countertops, etc.) contaminated with aqueous solutions of more than 0.1% EtBr should be decontaminated using the spill clean-up procedures listed above.

Waste Minimization

The U.S. Congress has made waste minimization a national policy and goal of each waste generator. You, as a generator of EtBr, have the responsibility to minimize the waste you generate. Waste minimization has benefits such as decreasing your exposure to hazardous substances, protection of the environment, and decreasing the cost of disposal, which can exceed the initial cost of the material by many times. EtBr waste minimization should be considered at all times. The following are suggestions for minimizing waste:

- Substituting less or non-hazardous materials for hazardous materials
- Using dilute rather than concentrated solutions
- Using micro or semi-micro techniques
- Using computer modeling/simulation, films, videotapes or demonstrations instead of performing individual experiments.

If you have any questions or would like assistance with waste minimization, please contact the Environmental Health and Safety Office at 837-9314.