

Ethidium Bromide Disposal

Ethidium Bromide (EtBr) is a commonly used marker or stain for identifying nucleic acids in electrophoresis gels. EtBr has mutagenic properties that pose a hazard and require it to be managed properly and safely.

Wear personal protective equipment (gloves, goggles, lab coat) when handling EtBr. Also, protect yourself from any UV source you may use.

Electrophoresis Gels

Gels, filters, and other solids containing EtBr at **ANY** concentration must be disposed of through EH&S as a hazardous waste by visiting <http://www.ehs.uci.edu/programs/enviro/> and filling out the Chemical Waste Collection form. Place them in a sealed bag or container (**DO NOT PLACE IN BIOHAZARDOUS WASTE BAGS**) and attach an EH&S hazardous waste label.

Aqueous Solutions

EtBr **IS NOT** allowed to be disposed of down the sink. EtBr solutions must be disposed of through EH&S by visiting <http://www.ehs.uci.edu/programs/enviro/> and filling out the Chemical Waste Collection form, or they need to be rendered non-toxic at the end of the experiment. Two accepted methods are extraction/absorption and chemical degradation.

Both methods will require you to follow the steps outlined in AB966 Benchtop Treatment i.e.

- The laboratory hazardous waste treated is less than 5 gallons or 18 kg per batch whichever is greater.
- The laboratory hazardous waste is treated at the point of generation.
- Treatment is conducted within 10 calendar days of accumulation.
- The person performing the treatment has knowledge of the laboratory hazardous waste being treated, including knowledge of the procedure that generated the waste, and has received hazardous waste training.

Extraction/ Absorption

This is an effective method that uses an activated charcoal filtration system. Simply pour the EtBr solution through the activated charcoal. Prior to drain disposal, check for fluorescence by using a UV light to ensure complete removal of EtBr. When the filter is saturated, the charcoal must be disposed of through EH&S. You can build your own filter or purchase one. There are also "tea bag" filters that can be purchased. Several companies are listed below:

<u>Company</u>	<u>Product</u>	<u>Phone</u>
Stratagene	Eliminator Ethidium Bromide Dye Removal System	800-424-5444
AMRESCO	Destaining Bags for Ethidium Bromide	800-829-2802
CLONTECH	BondEX Ethidium Detoxification System	800-662-2566

Chemical Degradation

There are many methods to chemically deactivate EtBr, but some are now thought to produce harmful gases (chlorine) or more mutagenic compounds. EH&S recommends using the Lunn and Sansone Method¹ in the chemical exhaust hood.

Lunn and Sansone Ethidium Bromide Destruction Method

Note: A small amount of nitrogen dioxide may be given off when the decontamination solution is initially mixed, so the procedure should be carried out in a chemical fume hood.

1. Carry out the following steps in a fume hood and follow all laboratory safety precautions, including proper protective clothing.
2. Dilute solutions containing EtBr to concentration < 0.05% w/v (50mg/100mL).
3. For each 100mL of EtBr solution add 20mL of fresh 5% hypophosphorous acid and 12mL of fresh 0.5M sodium nitrite solution. Check that the pH of the solution is < 3.0. Stir briefly.
4. After reacting for at least 20 hours, adjust pH to 5-9 with sodium bicarbonate, and then rinse the solution down the sanitary sewer with water.

¹ Lunn, A. & Sansone, E.B., Destruction of Hazardous Chemicals in the Laboratory, John Wiley & Sons, New York, 1990, p.119-120.