



Hazardous Waste Program Factsheet

Ethidium Bromide

Ethidium Bromide (EtBr) is a commonly used marker or stain for identifying nucleic acids in electrophoresis gels. Because EtBr has mutagenic properties it meets California's definition of hazardous waste and must be disposed of through EH&S or treated as part of the experiment protocol.

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

Disposal

Electrophoresis Gels: Gels, filters, and other solids containing EtBr must be disposed of through EH&S if they are unable to be made non-hazardous by treatment. Place them in a sealed bag or container (no biohazard bags). Attach the EH&S hazardous waste label prior to requesting a hazardous waste pickup.

Aqueous Solutions: Ethidium Bromide solutions >0.15% **ARE NOT** allowed to be disposed of down the sink. EtBr solutions must be disposed of through EH&S 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.

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 Method.

Lunn and Sansone Method (For each 100ml of EtBr solution)

- Add 5% hypophosphorus acid
- Add 12 ml of 0.5 M sodium nitrite
- Stir briefly and let stand for 20 hours
- Adjust pH to 5-9 using sodium hydroxide
- Pour down drain with copious amounts of water

Ethidium Bromide (continued)

Spill Procedures

Carefully wipe any solid EtBr up with wet paper towels. Absorb any liquid spill with dry paper towels. Use a UV light to locate the spill boundaries and prepare the decontamination solution:

4.2g of sodium nitrite
20 ml of hypophosphorous acid (50%)
Stir into 300ml of water

Wash the area with the solution. Then rinse the area several times with water and paper towels. Place all paper towels into the solution for 1 hour. Check cleanup area with UV light to verify it was complete. Place decontamination solution in a bottle and label with the EH&S Hazardous Waste Labels. Place any contaminated solid debris (towels, gloves) in a bag and label with the EH&S Hazardous Waste Labels. Call EH&S to notify us of the spill and to remove the waste.

Substitute for Less Hazardous Chemicals

There are less hazardous products that can be substituted for EtBr. Two are listed below:

[Sybr Safe](#) is manufactured by Invitrogen

MegaFluor is manufactured by Euroclone www.euroclone.net

References

Lunn, G. & Sansone, E.B., Destruction of Hazardous Chemicals in the Laboratory John Wiley & Sons, New York, 1990, p.119-120.
22 CCR 66262.24(a)(8)