NYU
Safety Policy Manual

Subject: **ETHIDIUM BROMIDE SAFETY** | Policy No. 119

APPLICATION

All New York University academic facilities.

PURPOSE

It is the intention of New York University to ensure: 1) that human health and the environment are protected; 2) the safe use, storage and disposal of ethidium bromide and ethidium bromide waste; and 3) the minimization of the amount of ethidium bromide waste generated.

POLICY AND GENERAL INFORMATION

Ethidium Bromide is a highly toxic chemical and potent mutagen frequently used to identify DNA. This material fluoresces a red-orange color under ultraviolet light. Ethidium bromide is typically purchased in powder or solution form and is soluble in water. The crystal or powder form is odorless and appears dark red in color.

The powder form is considered an irritant to the upper respiratory tract, eyes and skin. Ethidium bromide is strongly mutagenic, causing living cell mutations. Even though there is no evidence at this time of this material being a human carcinogen or teratogen, handling and care should be taken as if it was proven to be.

1.0 RESPONSIBILITIES

1.1 The Senior Director of Environmental Services or designee is responsible for:

1.1.1 developing the Ethidium Bromide Safety Policy;

1.1.2 providing the departments with information about the Policy;

1.1.3 assisting the departments in implementing the Policy;

1.1.4 periodically evaluating the effectiveness of the Policy; and

1.1.5 maintaining ethidium bromide waste disposal records.

1.2 Department Chairpersons, or designees, are responsible for compliance with the Policy in their departments. Their responsibilities include:

1.2.1 ensuring that all employees who work with ethidium bromide receive information about this Policy; and

1.2.2 ensuring that waste is collected in appropriate containers, stored and labeled properly, removed on a regular basis and/or treated and sewered as outlined in section 3.0.

1.3 Employees who work with Ethidium Bromide are responsible for:

1.3.1 being familiar with the hazards of Ethidium Bromide;

1.3.2 collecting, storing, labeling and managing Ethidium Bromide waste in accordance with this Policy; and

1.3.3 notifying their supervisors of any exposures, spills or any other pertinent problems.

2.0 WASTE MINIMIZATION

2.1 Environmental Services recommends that if it is possible to use a less hazardous chemical for the identification of DNA, please do so. Some experiments may allow the use of an inert red tracer called "REDTAQ DNA Polymerase" produced by Sigma-Aldrich (www.sigma-aldrich.com).

2.2 Where practical, purchase ready-made stock solutions from chemical manufacturers in lieu of mixing your own solutions. One such product already in use on campus is the "Edvotek DNA Insta-stain". Go to: www.edvotek.com or call 1.800.338.6835 (1.800.EDVOTEK).

2.3 If you prefer to mix your own solutions of ethidium bromide, protect yourself by doing this process in a fume hood. Perform all processes that generate ethidium bromide dusts or mists inside the fume hood to minimize inhalation exposures.

3.0 WASTE COLLECTION/WASTE DISPOSAL

3.1 Waste collection containers must be leak-proof, capable of being sealed tightly, and in good condition.

3.2 Solid ethidium bromide waste <0.1% can be doubled bagged and thrown into the trash.

3.2 Solid ethidium bromide waste >0.1% (including gloves, gels, contaminated towels, used Evotek DNA Insta-stain strips and spill cleanup material) should be double-bagged and tightly sealed or collected in a closed container. A hazardous waste label must be completely filled out and attached to the bag or container. Only then can the waste be turned in via Environmental Services for waste disposal.

3.3 Liquid ethidium bromide waste <0.1% can be put down the drain.

3.4 Liquid ethidium bromide waste with a concentration >0.1% should be filtered via AMRESCO Destaining Bags or BIO 101 EtBr "Green Bag" Kit. Both methods are inexpensive and simple to use. Simply drop the bag into your solution, periodically swirl it around a few times, and let it stand overnight. In the morning, remove the bag and collect it as solid ethidium bromide waste. Then perform a spot check of the solution using a UV transilluminator to see if it fluoresces. If it does not, approximately 99% of the ethidium bromide has been removed and the solution is now safe to pour down the drain-provided no other hazardous chemicals are present.

3.5 Technical information outlining each bag's capabilities and limitations can be obtained via their websites. For the AMRESCO Destaining Bags go to www.amresco-inc.com (registration is necessary in order to access the technical bulletin. Go to site map then register as "guest") or call AMRESCO at 800-829-2805. For the BIO 101 EtBr "Green Bag" Disposal Kit go to http://qbiogene.com/products/electrophoresis/EtBr_page1.shtml or call BIO 101 at 800-424-6101.

3.6 Liquid ethidium bromide waste with a concentration equal to or above 0.1% can also be collected in closed, labeled containers and turned in for disposal via Environmental Services. The "destaining bags" and "green bags" have a more limited effect on higher concentrations of ethidium bromide and this waste poses a greater hazard to human health and the environment.

3.7 Loose needles and syringes must be placed in red "biohazardous" sharps containers. Contact the Building Manager for disposal.

4.0 SPILLS

4.1 Do not attempt to clean up large spills of ethidium bromide. Evacuate the area and call Public Safety at 82222.

4.2 When working with ethidium bromide, try to minimize the potential for spills. Work with small amounts and use absorbent bench-top liners with polyurethane backing.

4.3 Small spills of ethidium bromide solutions should be absorbed and decontaminated with soap and water. Avoid raising dust when cleaning up solid spills by mixing with water then absorbing the solution with a neutral absorbent like diatomaceous earth or a spill pad. All spill cleanup materials and absorbents should be double-bagged or placed in a sealed container with a completed hazardous waste label to be turned in via Environmental Services for waste disposal. (See Section 3.0 for Waste Disposal)

4.4 Some facilities use a hand held UV lamp to check for residual ethidium bromide contamination following spill cleanup. A reddish-orange fluorescence can be detected under UV wavelengths. Users of the hand held lamps should be aware that their ability to detect small spills is not guaranteed. The ease of detection depends upon a variety of factors including the chemical composition of the sample, the wavelength of the UV lamp, and the intensity of the lamp. Use of a hand held UV lamp to detect traces of ethidium bromide may serve as an occasional check of laboratory practices, but it cannot substitute for good cleanliness and careful contamination control.

5.0 PERSONAL PROTECTION EQUIPMENT

5.1 Wear a lab coat, chemical splash goggles, and nitrile gloves when working with ethidium bromide. Leave lab coats, gloves, and other PPE in the lab, to prevent the spread of this or other chemicals outside of the lab.

5.2 When ultraviolet light source is used in your work with ethidium bromide, added caution is required. As a general rule, avoid exposing unprotected skin and eyes to intense UV sources. If the UV light is aimed upwards, wear a UV protective face shield when you are standing near the source. (Please refer to Policy No. 112 – The Use and Selection of Personal Protection Equipment).

6.0 ACCIDENTAL EXPOSURES

6.1.1 Contact in eyes – immediately flush eyes with water at eyewash station for fifteen minutes.

6.1.2 Contact on skin – immediately wash with soap and water for fifteen minutes.

6.1.3 Contaminated clothing should be removed immediately and placed in a sealed plastic bag or container.

6.1.4 If exposed to ethidium bromide seek professional medical care.