



Laboratory-Specific Standard Operating Procedures

**TITLE: SOP for the safe use of Ethidium Bromide**

Date: 3/26/2015

Review Date:

Revised:

Principle Investigator:

Authors (Names):

Department, Building, Room(s):

Contact Phone Number:

This SOP must be kept on file for all laboratory employee training and review.

**Section 1: (Check One)**

There are three methods that can be used to write SOPs. They are: by process (distillation, synthesis, chromatography, etc.); by individual hazardous chemical (benzene, phenol, arsenic, etc.); and by hazardous chemical class (flammable, corrosive, oxidizer, etc.).

Process                       Chemical                       Hazard Chemical Class

**Section 2: Describe Process, Hazardous Chemical or Hazard Class**

Provide a general description of what activities are covered under this SOP.

- Ethidium bromide (CAS# 1239-45-8) is a purple/dark red, crystalline, non-volatile solid, moderately soluble in water, which fluoresces readily with an orange color when exposed to ultraviolet light. Its formula is 2,7-Diamino-10-ethyl-9-phenyl-phenanthridium bromide. Other names used for Ethidium bromide are Homidium bromide and the abbreviation Etbr.
- Ethidium bromide is a non-radioactive marker used for identifying, and visualizing nucleic acid bands in electrophoresis and in other methods of gel-based nucleic acid separation.

**Section 3: Potential Hazards**

Describe the potential hazards for each process, hazardous chemical or hazard class. Include physical and health hazards.

- Ethidium bromide binds to DNA and is a potent mutagen and exhibits moderate toxicity after acute exposures. Metabolites of Etbr may have increased mutagenicity. Etbr should be handled as a possible reproductive hazard, and is also an irritant to the skin, eye, mouth, and upper respiratory tract.

#### **Section 4: Personal Protective Equipment**

Identify the required PPE. If a respirator is required, contact EH&S before using.

- Lab coats, closed-toed shoes, nitrile gloves, and chemical safety goggles are needed.
- When UV light is used with Ethidium bromide, appropriate shielding and UV-resistant eyewear should also be employed.

#### **Section 5: Engineering Controls**

Describe engineering controls that will be used to prevent or reduce employee exposure to hazardous chemicals.

- Pure Ethidium bromide should only be handled in a chemical fume hood.

#### **Section 6: Special Handling and Storage Requirements**

List storage requirements for hazardous chemicals involved with the SOP, including specific area, and policies regarding access to chemicals. Special procedures such as dating peroxide formers are appropriate here. Is a special “designated area” required?

- Ethidium bromide should be stored away from strong oxidizing agents in a cool, dry place, and the container must be kept undamaged and tightly closed.
- Ethidium bromide will only be handled in the chemical fume hood and on the bench next to the hood that is labeled “Ethidium bromide Work Area”.
- When working with Ethidium bromide, always thoroughly wash hands with soap and water after removing the nitrile gloves.

#### **Section 7: Spill and Accident Procedures**

Indicate how spills or accidental release will be handled. List the location of appropriate emergency equipment. Any special requirements for protection of personal from exposure should be identified here.

- For Accidents:  
An emergency shower and eyewash station is located in the laboratory. If Etbr contacts the eyes, immediately flush the eyes with copious amounts of cold water for at least 15 minutes. For skin contact, immediately wash the affected area with soap and copious amounts of cold water. After any exposure to Etbr, the affected person should immediately inform their supervisor of the exposure and seek medical advice.
- For Spills:  
Chemical spill kit is located in cabinet under the sink. For all spills, large or small, refer to the [EHS 200.002, Chemical Spill Response Procedures](#) (See attachment for spill response procedures). For large spills and accidents, place absorbent material on the spill, evacuate, and contact University Police (568-8999) or EH&S (952-1337).

### **Section 8: Decontamination Procedures**

Specify decontamination procedures to be used for equipment, glassware, and clothing: including equipment such as hoods, lab benches, and controlled (special “designated area”) areas within the lab.

- Prepare the decontamination solution just prior to use. The solution consists of 4.2 g of sodium nitrite and 20 ml of 50% hypophosphorous acid in 300ml of water. Since the decontamination solution is acidic, wear lab coat, gloves, and goggles while preparing and handling the solution.
- Other decontamination solutions that may be used are 70% ethanol or a soap/water solution.
- Decontamination Procedure:
  - Wash the area with a paper towel soaked in decontamination solution.
  - Rinse the area five times with paper towels soaked with tap water, using a fresh towel each time.
  - Place the towels and the contaminated gloves in a 4 ml polyethylene bag lined cardboard box (provided by EHS).
  - Using a UV light, check the area to ensure that all the Etbr has been removed. If any Etbr is present, repeat the decontamination process until no Etbr is present.

### **Section 9: Waste disposal Procedures**

Waste must be disposed in accordance with [LSUHSC EHS 200.04, Chemical Waste Management Procedures](#).

- For disposal of all dry Etbr contaminated items such as gels, pipettes, paper towels, etc., place in a 4 ml polyethylene bag lined cardboard box (provided by EH&S) or a sealed glass receptacle. When the container is  $\frac{3}{4}$  full, close and seal. Label the container with the type of waste (Ethidium bromide), date, researcher’s name, building, room number, and the words “hazardous waste”.
- To schedule a waste pick-up by EH&S, use the [bob.lsuhs.edu](http://bob.lsuhs.edu) service request system.