

## Ethidium Bromide Factsheet

Ethidium bromide (2,7-diamino-10-ethyl-9-phenylphenanthridinium bromide) is used as a nucleic acid stain which fluoresces in the presence of ultraviolet (UV) light. It is commonly sold in a powder form which is soluble in water. The powder is dark red or purple in color. It is a strong mutagen as well as a possible teratogen and carcinogen. It causes irritation to the eyes, skin, and respiratory system and enters the body through inhalation or ingestion.

**SDS:** <http://fscimage.fishersci.com/msds/45442.htm>

### RECOMMENDED SAFETY PRACTICES

#### Personal Protective Equipment (PPE)

Proper PPE is very important due to the irritating properties of ethidium bromide. Always wear a laboratory coat, closed toed shoes, eye protection, and gloves when handling ethidium bromide or anything with ethidium bromide on it.

#### Usage

Weighing and measuring powder for stock solutions should be done in a fume hood. Premade, aqueous solutions are also available to purchase. Always wash your hands after handling.

#### Storage

Ethidium bromide should be stored in a cool, dark place away from strong oxidizing agents. Always keep the container tightly closed when not in use.

### EMERGENCY EXPOSURE PROCEDURES

**Eyes:** If contact with eyes, immediately flush with copious amounts of cool water for at least 15 minutes. Remove contacts lenses if possible.

**Skin:** If spilled on an individual, immediately remove any contaminated clothing. Rinse exposed body parts with water and then wash with soap and copious amounts of water for 15 minutes.

**Ingestion/Inhalation:** If swallowed or inhaled, seek medical attention immediately. Remove victim to fresh air. Bring information (safety data sheet) about ethidium bromide to medical center with you.

### RECOMMENDED DISPOSAL METHODS

**Solid Waste** (agarose gels, gloves, paper towels, test tubes, etc): All solid ethidium bromide waste must be collected in a double-bagged, sealed, plastic container. Central Stores sells 5-gallon plastic buckets with lids. Empty plastic chemical containers also work well for small amounts of waste.

1. Attach an orange waste tag to each container of waste and place in the designated satellite accumulation area.
2. Request a [Waste Removal](#)
3. The plastic container of waste will be picked up and incinerated and not returned to the user.

**Liquid Waste:** Liquid ethidium bromide waste can be collected in the same container as the solid waste. Otherwise, aqueous solutions must be deactivated before disposal. A UV light can be used to determine complete inactivation. After inactivation, the solution, devoid of ethidium bromide, can be poured down the drain with copious amounts of water. The following are methods of deactivating liquid, ethidium bromide waste:

- **Filtration:** Filtration is accomplished by putting aqueous solution through a bed of activated charcoal. Whatman® makes a funnel system containing an activated carbon matrix which can remove >99% of the ethidium bromide from solution. After use the filter should be disposed of with the other ethidium bromide contaminated solid waste. This system is available from Sigma-Aldrich Company® (catalog #: Z361569) or VWR International® (catalog #: 28165-500).
- **Absorption:** “Tea bags”, specifically designed to absorb ethidium bromide, can be used to remove ethidium bromide from solution. The bags are placed into the liquid waste and allowed to sit for the allotted amount of time. Do not exceed the tea bags, capacity of absorption of ethidium bromide. Once inactivation is complete, the bags are disposed of with the other ethidium bromide contaminated solid waste. Tea bags are available through Amresco Inc.® (catalog #: E732) or MP Biomedicals® (catalog #: 2350-200)

## ALTERNATIVES

Less-toxic alternatives to ethidium bromide are available (SYBR Safe™ DNA gel stain or Biotium). Switching to one of these will reduce the potential hazardous exposure to ethidium bromide in the lab. Disposal of these alternatives is coordinated by EH&S. Contact EH&S with any questions at (515) 294-5359.