



Chemical Fact Sheet

Ethidium Bromide Chemical Safety Fact Sheet



Ethidium Bromide is the most common nucleic acid stain and an important ingredient for agarose gel electrophoresis procedures. Ethidium bromide intercalates bases of ribonucleic acid (RNA) and deoxyribonucleic acid (DNA). Ultraviolet (UV) light causes ethidium bromide to fluoresce. This fluorescence increases when it has bonded to DNA. Ethidium bromide is a useful nucleic acid stain because of its availability, orange fluorescence and its ability intercalate DNA and RNA bases.

Training

Only individuals who have received proper training may use ethidium bromide at the Harvard Institutes of Medicine (HIM) and New Research Building (NRB). The training shall include review of this data sheet, understanding the chemical's material safety data sheet (MSDS), and receiving appropriate instruction from the supervisor or principal investigator on laboratory procedures.

Possible Risks of Exposure

Ethidium bromide is a mutagen. It is positive for the Ames test (a test used to determine mutagenicity) and may also act as a carcinogen. Employees must use appropriate personal protective equipment including chemical-resistant gloves, laboratory coat and safety goggles while preparing and handling ethidium bromide gels and solutions. Excess gels as well as all contaminated materials should be removed as hazardous waste.

In addition, the use of UV light poses risks of UV exposure. While working with UV light, appropriate UV protection should be worn including UV protective safety glasses and/or face shield and a laboratory coat.

The Following Practices Must Be Followed Within Laboratories Using Ethidium Bromide

- Provide job-specific training to staff.
- All exposure should be avoided by using a fume hood and through proper chemical handling.
- **Nitrile and neoprene gloves** provide adequate protection when preparing ethidium bromide gels. A laboratory coat and **safety goggles** must also be worn when working with ethidium bromide gels.
- Do not eat, drink, smoke, chew gum, apply cosmetics or lip balm in laboratory areas, ever.
- Change disposable gloves frequently and always wash hands after glove removal.
- Ethidium bromide must be disposed of as a hazardous waste and collected in the laboratory satellite accumulation area.
- Ethidium bromide neutralization can be hazardous and may not be recommended. Contact the HIM/NRB Environmental Health & Safety (EH&S) Office at 617-432-2762 for details.
- A UV light can be used to detect ethidium bromide contamination within a laboratory.
- Call 617-432-1901 if there has been an ethidium bromide spill.

Occupational Exposure Limits

The U.S. Occupational Safety and Health Administration does not have an enforceable permissible exposure limit for ethidium bromide. Other non-regulatory advisory groups such as the National Institute for Occupational Safety and Health and the American Conference of Governmental Industrial Hygienists also do not have recommended exposure limits. As such, all employee exposure should be prevented using the methods discussed above. If you are exposed to ethidium bromide, you must wash and flush the affected area and report the incident to your institution's occupational health services department and your supervisor.

Also See:

- Ethidium Bromide MSDS
- HIM-NRB Chemical Hygiene Plan available on the HIM/NRB EH&S Webpage: <http://www.himnrbehs.com/himnrbehs/chemicalSafety.asp>

For more information contact the HIM/NRB EH&S Office, 617-432-2762.