Department of Plant Agriculture, University of Guelph

Standard Operating Procedures for Ethidium Bromide in Common Equipment Rooms 418/322/216

Revised: August 29 2002

Reviewed by Env Health and Safety 15 August 2002

Effective: Immediately

Applicable Legislation:

Occupational Health and Safety Act (OHSA), R.S.O. 1990, Sections 27 (2) (a), 27 (2) (c).

Intent: To outline safe handling procedures of ethidium bromide, including any equipment that is used in conjunction with ethidium bromide, and to outline potential hazards and first aid measures should incidences occur.

Definitions:

Ethidium bromide	A chemical used for the visualization of nucleic acids. Appearance is dark red to purple.
Gel documentation system	A system composed of a computer (and software), camera and ultra violet light source used for photo documentation of electrophoretic gels which contain ethidium bromide.
Ultra violet (UV) light	light used for the visualization of ethidium bromide
Qualified person	A person who, in respect of a specific duty, is qualified by knowledge, training and experienced to perform the duty safely and properly.

Requirements of OHSA, Section 27 (2) (a) and Section 27 (2) (c)

27.(2) (a) A supervisor shall advise a worker of the existence of any potential or actual danger to the health or safety of the worker of which the supervisor is aware.

27. (2) (c) Take every precaution reasonable in the circumstances for the protection of a worker.

Potential Hazards

Inhalation:
The dust is very toxic by inhalation. Inhalation of dust irritates the respiratory tract.
Ingestion:
No information found, but compound should be handled as a potential health hazard.
Skin Contact:
Inflammation and discoloration of the skin may occur after contact. Contact will stain the skin purple.
Eye Contact:
Causes irritation, redness, and pain.
Chronic Exposure:
May cause heritable genetic damage.
Aggravation of Pre-existing Conditions:
No information found.

Description of Procedures

1. All persons shall consult the Material Safety Data Sheet and SOP on ethidium bromide before using the chemical.

2. All persons shall wear personal protective equipment when handling ethidium bromide. This includes wearing a lab coat, nitrile gloves and closed toe shoes when working with ethidium bromide. Other personal protective equipment (such as goggles) are optional. Leave lab coats, gloves, and other personal protective equipment in the lab once your work is complete to prevent the spread of this or other chemicals outside of the lab.

3. All work with ethidium bromide is to be done in an "ethidium bromide" designated area in order to keep ethidium bromide contamination to a minimum. Any persons in this area are required to wear personal protective equipment. Safety shower and eye wash stations should be easily accessible where ethidium bromide is used.

4. All laboratory equipment (such as beakers, pipettes, gel electrophoresis systems etc) used in the "ethidium bromide" designated area are to be labelled as "ethidium bromide contaminated" and are not to be removed from the area without first being decontaminated. An exception to this are gel trays which are used to transport electrophoretic gels to the gel documentation system.

5. Only qualified persons shall operate the gel documentation system. All persons shall wear nitrile gloves and lab coats when carrying gels to the gel documentation system. Once at the gel documentation system all ethidium bromide contaminated items are to be placed on a tray designated for ethidium bromide contaminated material.

6. **When operating the gel documentation system, no person is to touch the system with contaminated gloves.**

7. Persons operating gel system are to take added caution when using ultraviolet light to visualise gels. Persons are to make sure the UV light is off before they open the UV box and that the UV light is turned off when they are finished. 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. For prolonged work close to UV light boxes or other intense sources it may be useful to wrap the end of the lab coat sleeves loosely with masking tape to prevent gaps where the wrist could be exposed.

8. Once finished at gel documentation system, all persons shall record usage in a log book placed by the system.

Waste Management and Environmental Responsibility

Waste disposal procedures

1. All solid ethidium bromide contaminated waste shall be disposed of into waste bins specifically designated for ethidium bromide waste. Examples of solid ethidium bromide waste material include gloves, pipette tips, paper towels, and electrophoretic gels.

2. Once the waste bin is full, the workplace supervisor is to dispose of the ethidium bromide contaminated waste via the university hazardous waste disposal system.

Decontamination of Equipment

Equipment that needs to be decontaminated (for repair or change of location etc) must be placed in a mixture of one part bleach, one part soap and one part water. Let the equipment soak for a couple of hours and then wash and rinse equipment with copious amounts of water.

Handling and Storage Requirements

Store in a cool, dry place away from strong oxidizing agents. Keep containers tightly closed when not in use. Use with adequate ventilation. Avoid contact with eyes and skin. Wash hands thoroughly after handling.

Contingency Plan and Reporting

All accidents and spills will require persons involved to fill out an "incident report" after the situation has been contained

Accident response

For first aid measures for specific accidents involving ethidium bromide, consult the Material Safety Data Sheet for ethidium bromide.

Spill clean up

All labs should have a spill kit available. Spills of ethidium bromide solutions should be absorbed and decontaminated with soap, bleach and water mixture or by use of the spill kit. Avoid raising dust when cleaning up solid spills by mixing with water and then absorbing the solution. All spill cleanup materials and absorbents should be disposed of in designated ethidium bromide waste bins. Removal of waste will be done via the university hazardous waste disposal system.

References:

Material Safety Data Sheets: Fisher Scientific
Occupational Health and Safety Act (OHSA)