ENVIRONMENT, HEALTH, & SAFETY

Laboratory Standard Operating Procedure for:

B-mercaptoethanol

Description

This standard operating procedure outlines the handling and use of B-mercaptoethanol (BME). Review this document and supply the information required in order to make it specific to your laboratory. In accordance with this document, laboratories should use appropriate controls, personal protective equipment, and disposal techniques when handling BME.

BME is used as an enzyme reactivator in inhibited systems, a reducing agent in the fluorescent reaction of o-phthaldialdehyde, and amino-acids in alkaline media and is also used to dissociate proteins.

Potential Hazards

- BME has a very low odor threshold (0.12-0.64 ppm) and smells similar to the odorant used in natural gas. If the odor becomes widespread, people in nearby areas may suspect a natural gas leak. This can lead to calls to the fire department and/or evacuation of the building, which can be inconvenient and disruptive.
- BME can be toxic if ingested and fatal if inhaled or absorbed through the skin.
- Vapors can irritate the eyes, mucous membranes, and respiratory tract. Symptoms of inhalation exposure may include coughing, sore throat, and/or shortness of breath.
- When BME is heated to decomposition, toxic fumes including sulfur oxides and carbon oxides will be emitted.
- BME is combustible as a liquid or vapor.
- Reactions of BME with strong acids or alkali metals will release flammable hydrogen gas.

Engineering Controls

ALWAYS work with BME inside a chemical fume hood or 100% exhausted biological safety cabinet (Class II, Type B2).

Work Practice Controls

- BME is incompatible with metals, oxidizing agents, acids, alkalis, calcium hypochlorite, aliphatic amines, and isocyanates.
- Purchase and use in the smallest practical quantities for the experiment being performed.
- Know the location of the nearest fire extinguisher before beginning work.
- Eliminate ignition sources such as open flames and hot surfaces.
- Keep containers closed as much as possible when not in use.
- Be aware of skin absorption as a possible route of exposure. Plan work so that minimal glove contact is expected, and purchase appropriate gloves for cleaning up small spills.
- If glove contact occurs, change gloves immediately.

Personal Protective Equipment (PPE)

At a minimum, double-glove using nitrile laboratory gloves and wear a lab coat and safety glasses when working with BME. If there is a possibility of splashing, wear chemical splash goggles and/or a face shield.

Transportation and Storage

- Do not store near sources of ignition, oxidizing agents, acids, alkaline compounds, or any other incompatible materials.
- Store BME in a sealed secondary container in a well-ventilated area.
- The container must be tightly closed, resealed, and stored upright to avoid leakage.
- Avoid storing on the floor.
- Transport toxic liquids in secondary containment, preferably a polyethylene or other non-reactive acid/solvent bottle carrier.
- Suitable fire control devices (such as fire extinguishers) must be available at locations where flammable or combustible liquids are stored.

Waste Disposal

Handle and store hazardous waste following the guidelines above for work practice controls, transportation and storage. Contact EHS at (810) 766-6763 for waste containers, labels, manifests, waste collection and for any questions regarding proper waste disposal. Also refer to UM-Flint Hazardous Waste Management Program and EHS webpage http://www.umflint.edu/ehs/environment-health-and-safety for more information.

Exposures/Unintended Contact

 ***If the employee is in need of emergency medical attention, call 911 immediately.*** 

For an actual chemical exposure/injury:

- In case of *skin contact*: Flush the skin with copious amounts of water for at least 15 minutes, and then seek medical attention (see below).
- In case of *eye contact*: Flush contaminated eye(s) immediately with copious amounts of water for at least 15 minutes, and then seek medical attention (see below).
- In case of *inhalation*: Assist conscious persons to an area with fresh, uncontaminated air, and then seek medical attention (see below).

Contact EHS for advice on symptoms of chemical exposure, or assistance in performing an exposure assessment.

Report all work related accidents, injuries, illnesses or exposures to UM-Flint DPS. Additionally, employees and supervisors must be sure to report the injury to EHS and complete and submit the Illness and Injury Report Form to WorkConnections within 24 hours. Follow the directions on the WorkConnections website Forms Instructions to obtain proper medical treatment and follow-up.

If you were involved in or observed an incident or near miss, please complete the EHS Laboratory Incident and Near-Miss Report Form. This will be valuable in improving laboratory safety on UM-Flint campus.

TREATMENT FACILITIES:

MAJOR INJURIES	MINOR INJURIES –During Business Hours	MINOR INJURIES –After Business Hours
Genesys Hospital One Genesys Parkway Grand Blanc, MI 48439 (810) 606-5710 **Hurley Medical Center** One Hurley Plaza Flint, MI 48503 (810) 262-9000 **McLaren Hospital Flint** 401 South Ballenger Hwy Flint, MI 48532 (810) 342-2000	**Genesys Occupational Health Network** 1460 Center Rd. Burton, MI 48509 (810) 715-4620 Mon. to Fri. 7:30 am to 10 pm Sat. & Sun. Noon to 8 pm **McLaren Flint-Burton OCC Center** 1459 S. Center Rd. Burton, MI 48509 (810) 496-0900 Mon. - Fri. 8 am to 8 pm Sat & Sun 10 am to 2 pm	**Downtown Flint** 420 S. Saginaw St. Flint, MI 48502 (810) 762-1550 **Genesys East** 1096 S. Belsay Rd, Suite F Burton, MI 48509 (810) 743-3351 **Genesys North** 4154 W. Vienna Rd Clio, MI 48420 (810) 686-7397 **Genesys South** 8447 N. Holly Rd Grand Blanc, MI 48439 (810) 603-0856 Mon. - Fri. 6 to 10pm / Sat. & Sun. 1-10pm

Click here for more information on the UM – Flint Emergency Preparedness and Response Plan.

Spill Procedure

- When a spill occurs, ***personal safety should always come first***.
- Alert and clear everyone in the immediate area where the spill occurred.

Employees in the area should be prepared to clean up minor spills confined to the chemical fume hood. Wearing appropriate gloves (e.g. butyl rubber, Silver Shield, nitrile), splash goggles, lab coat (and impermeable apron, if available), use an inert absorbent material (sorbent pads, vermiculite, dry sand) to clean up the spill. Do not use combustible materials (i.e. saw dust) to absorb spill. Contaminated PPE and clean-up materials must be placed in a sealed container for pick-up by EHS (see waste disposal section for more information).

For large spills, or any spills of BME outside of the fume hood, contact the University of Michigan-Flint Department of Public Safety (DPS) at 911 from any university telephone or (810) 762-333 from any cell phone or non-university telephone..

Additional Spill Links:

- www.oseh.umich.edu/pdf/chemspil.pdf
- http://www.oseh.umich.edu/emer-chemical.shtml.

Report all emergencies, suspicious activity, injuries, spills, and fires to the UM-Flint Department of Public Safety (DPS) at 911 from any university telephone or (810) 762-3333 from cell phone or non-university telephone. Register with the University of Michigan-Flint Emergency Alert System via Wolverine Access. Also, preprogram the UM-Flint DPS telephone number (810) 762-3333 into your cell phone for quick, easy use.

Training of Personnel

All personnel are required to complete Laboratory Safety Training. Documentation of the training is required. This training can be accomplished by completing the ***Comprehensive Laboratory Safety*** session (**BLS009** *or equivalent*) via MyLINC, or UM-Flint EHS on-line training or other equivalent approved by EHS. Furthermore, all personnel shall read and fully adhere to this SOP when handling B-mercaptoethanol.

Certification

I have read and understand the above SOP. I agree to contact my Supervisor or Lab Manager if I plan to modify this procedure.

Name	Signature	UM ID #	Date

Prior Approval required – Is this procedure hazardous enough to warrant prior approval from the Principal Investigator? ☐ **YES** ☐ **NO**

Principal Investigator _____ **Revision Date** _____