2-mercaptoethanol

Standard Operating Procedure

Revision Date: 05/11/22

This standard operating procedure (SOP) outlines the handling and use of 2-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.

# Description [Provide additional information as it pertains to your research protocol]

2-mercaptoethanol or beta-mercaptoethanol (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.

## Process [Write the steps for using the chemical in your research protocol]

# Potential Hazards [Provide additional information as it pertains to your research protocol]

* 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.
* BME is a potential skin sensitizer.
* 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 dioxide 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.
* BME reacts violently with strong oxidizers, bases and strong reducing agents.

# Engineering Controls [Provide additional information as it pertains to your research protocol]

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

# Work Practice Controls [Provide additional information as it pertains to your research protocol]

* 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.
* Contact EHS for assistance in performing an exposure assessment.

# Personal Protective Equipment [Provide additional information as it pertains to your research protocol]

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

# Transportation and Storage [Provide additional information as it pertains to your research protocol]

* BME is incompatible with metals, oxidizing agents, acids, alkalis, calcium hypochlorite, aliphatic amines, and isocyanates.
* Do not store near sources of ignition.
* 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 [Provide additional information as it pertains to your research protocol]

Handle and store hazardous waste following the guidelines above for work practice controls, transportation and storage. Contact EHS Hazardous Materials Management (EHS-HMM) at (734) 763-4568 for waste containers, labels, manifests, waste collection and for any questions regarding proper waste disposal. Also, refer to the EHS [Hazardous Waste](http://ehs.umich.edu/haz-waste/) Web page for more information.

# Training of Personnel

All personnel shall read and fully adhere to this SOP when handling BME.

# Certification

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

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### Major Revisions (Tracking purposes only -- Do not print as part of SOP)

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| Date | Revision |
| 09-13-18 | EHS name and logo were added, updated the formatting, and revised the content under Exposure/Unintended Content (AKJ). |
| 03-04-19 | Reviewed and updated. |
| 04-14-22 | Updated procedures for major spill response. (LGS) |
| 05-11-22 | Removed emergency response procedures section (LGS) |

**References**

ChemWatch. (n.d.). *2-Mercaptoethanol SDS*. Retrieved from ChemWatch Gold FFX: <https://jr.chemwatch.net/chemwatch.web/home>

National Library of Medicine

*PubChem Laboratory Chemical Safety Summary Beta-mercaptoethanol*: <https://pubchem.ncbi.nlm.nih.gov/compound/1567#datasheet=LCSS>