Tricaine Methanesulfonate (MS-222)

Standard Operating Procedure

Revision Date: 05/31/22

Laboratory Director (LD) Approval is Required Prior to Performing this Procedure

This standard operating procedure (SOP) outlines the handling and use of Tricaine Methanesulfonate (MS-222). Review this document and supply the information required in order to make it specific to your facility. In accordance with this document, laboratories should use appropriate controls, protective equipment, and disposal techniques when handling Tricaine Methanesulfonate (MS-222).

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

Tricaine Methanesulfonate (MS-222) is used for anesthesia, euthanasia, or sedation for fish and amphibians. It is administered by adding the solid powder directly to the water in which the species is held and is already acclimated. For larger species, it can be effective by applying it directly to the gill area.

Synonyms: Tricaine methanesulfonate, Syncaine, Tricaine mesylate, TMS, MS-222, 3-aminobenzoic acid ethyl ester methanesulfonate, Ethyl M-aminobenzoate, Aqualife TMS.

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

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

* Irritant, corrosive to eyes, respiratory system, and skin
* Retinal toxicity has been reported for workers with a history of long-term skin exposure
* The lethal dose when delivered intravenously to mice was 180 mg/kg (LD50).

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

* Use of chemical fume hood to prepare a concentrated stock solution by mixing an appropriate amount of Tricaine Methanesulfonate (MS-222) powder in a small volume of water. Alternatively use a top loading balance with a clear plastic wind guard.
* Laboratories and other spaces where handling of Tricaine Methanesulfonate (MS-222) occurs must be equipped with an eyewash station.

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

* Designate areas where Tricaine Methanesulfonate (MS-222) is stored or manipulated.
* The solution of Tricaine Methanesulfonate (MS-222) needs to be prepared fresh each time because it is light-sensitive and might form toxic by-products upon exposure to light.
* Wear nitrile gloves and use a utensil to stir until all powder is dissolved.
* Wear nitrile gloves to handle animals exposed to MS-222 to prevent systemic and dermal absorption.
* Decontamination should consist of surface cleaning with water and detergent followed by thorough rinsing. The use of detergent is recommended because there is no single accepted method of chemical deactivation for all agents involved. A plastic backed absorbent pad should be placed under the work area during preparation. This should be changed following use or when a spill occurs.

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

Personal protective equipment should include a laboratory coat, goggles and nitrile gloves. A N95 disposable respirator should be worn if weighing material outside of a fume hood or enclosed balance to reduce the potential for exposure to aerosolized Tricaine Methanesulfonate (MS-222). Under these circumstances, researchers will need to participate in the University of Michigan Respiratory Protection Program.

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

* Keep containers of Tricaine Methanesulfonate (MS-222) tightly closed and stored in a well-ventilated place.
* Check SDS for specific storage requirements.
* Tricaine Methanesulfonate (MS-222) is not regulated by DOT as a Hazardous Material.

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

Do not discard Tricaine Methanesulfonate (MS-222) directly into surface water, storm water conveyances, or catch basins.

Sharps – place needles, syringes with needles attached and other breakable items into appropriately labeled sharps containers.

Empty stock vials, reagent bottles, etc. – triple rinse with copious amounts of water. Deface label with black magic marker or scraper. Place in a cardboard box for disposal.

Because most spent, unused, and expired chemicals/materials are considered hazardous wastes, they must be properly disposed of. **Do not dispose of chemical wastes by dumping them down a sink, flushing in a toilet or discarding in regular trash containers, unless authorized by Environment, Health & Safety (EHS) Hazardous Materials Management (HMM)**. Contact 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 are required to complete the ***General Laboratory Safety Training*** session (**BLS025w** *or equivalent*) via the [EHS My LINC](http://ehs.umich.edu/education/) Web page. Furthermore, all personnel shall read and fully adhere to this SOP when handling Tricaine Methanesulfonate (MS-222).

# Certification

I have read and understand the above SOP. I have received prior approval from my Lab Director to perform this procedure. 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)

03-26-2018 Put into EHS format, changed department name, and fixed links.  
 Revised Spill Procedure section (AKJ).

04-09-18 Revised formatting (AKJ).

04-24-18 Changed injury type and action from paragraph to table format (AKJ).

05-02-18 Revisions per meeting with Jon (AKJ).

03904-19 Updated links and format (DML).