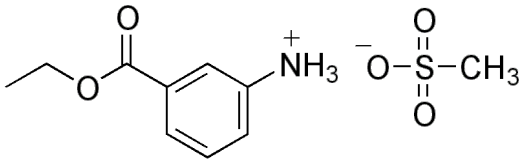
UMassAmherst | Environmental Health & Safety

Tricaine (MS-222) Fact Sheet

What is MS-222?

MS-222 is also known as tricaine methanesulphonate, tricaine mesylate, tricaine, tricaine-S, TMS, or Aqualife TMS. It is a white powder used for anesthesia, sedation, or euthanasia of fish/amphibians. It has long been recognized as a valuable tool for the proper handling of these animals during oocyte harvest (fish stripping), weighing, measuring, marking, surgical operations, transport, photography, and research may be performed under MS-222 anesthesia.



What are the potential hazards?

MS-222 is known to cause skin irritation, serious eye irritation and may cause respiratory irritation. Long-term occupational exposure to MS-222 has been associated with retinal toxicity in humans. The lethal dose when delivered intravenously to mice was 180 mg/kg (LD_{50}).

MS-222 is a muscle relaxant that operates by preventing action potentials. Muscle relaxant may block action potentials and neurological signals between the extremities and the brain.

Permissible Exposure Limit (PEL) and Threshold Limit Value – Time-Weighted Average (TLV-TWA) are not established for MS-222.

How can I safely work with MS-222?

1. Always wear appropriate personal protective equipment (PPE), including disposable nitrile gloves, safety glasses/splash goggles and lab coats, when handling any amount of MS-222, for powder, solution form and animals exposed to MS-222. If there is a high risk of splash, it is recommended to wear splash googles.

2. Work inside a fume hood to weigh the power and to prepare the solution, especially concentrated stock solution, by mixing an appropriate amount of MS -222 powder in a small volume of water. Agitate to dissolve the powder. In the field, it is recommended to prepare solutions in an outdoor open area.

3. Use of respirators is not required for MS-222 in research labs. If you wish to wear respirators, including N-95s, while working with MS-222, please refer to the requirements in the Respiratory Protection Program (https://ehs.umass.edu/respiratory-protection-program) for a workplace evaluation, further recommendations and more information.

4. MS-222 powder does expire. Do not use expired powder or solutions with a brownish color which indicates degradation has occurred. Always follow the manufacturer's directions for storage.

5. Do not discard MS-222 solution directly into surface water, storm water conveyances, catch basins, or into water supplies. Working solutions can be rinsed down the drain to sanitary sewers.

6. Animals that have been euthanized with MS-222 cannot be used for human consumption.

Waste Disposal:

Working solutions (pH should be between 5 - 10) can be rinsed down the drain to sanitary sewers. Stock solutions (concentrated solutions to make working solutions) may be collected with hazardous waste.

Hazardous waste should be placed in appropriate containers and labeled. The label should indicate all constituents in the waste using a percent format. To have the waste picked up by EH&S staff, complete a Hazardous Materials Pickup Request Form in CEMS (https://cems.unh.edu/umass/CEMS/RequestRemoval).

If you have additional questions about MS-222 use and handling, please contact EH&S at askehs@umass.edu.