



**Environmental Health & Safety Fact sheet:
MS-222**



MS-222 is also known as **Tricaine methanesulphonate** (TMS) and is used as an anesthetic and euthanasia agent for fish/amphibians.

Safety Practices for personnel using MS-222

MS-222 is very hazardous in case of skin contact therefore it is important to adhere to the following safety practices:

1. Wear personal protective equipment (PPE) – nitrile gloves, goggles and a lab coat – when handling any amount of MS-222.
2. Work inside a fume hood to prepare a concentrated stock solution by mixing an appropriate amount of MS-222 powder in a small volume of water. Place wet paper towels inside the fume hood to capture any spilled MS-222 powder.
3. It is most commonly administered by adding it 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.
4. For anesthesia, the optimum concentration used is 40-50 mg of TMS powder per liter of water. However, the optimum may vary with the size and species of the fish, and other variables. For euthanasia, MS-222 is commonly used at a concentration of 250 mg/liter.
5. Dilute the stock solution further as required.
6. The solution of TMS needs to be freshly prepared each time because TMS is light-sensitive and might form toxic by-products upon exposure to light. Researchers prepare this solution approximately once a month.
7. Wear gloves and use a utensil to stir until all powder is dissolved.
8. Wear gloves to handle animals exposed to MS-222
9. Dispose of MS-222 as hazardous waste by filling out a hazardous waste pick-up request: <https://cems.unh.edu/umass/CEMS/RequestRemoval>
10. If in a remote location the waste must be contained and brought back to campus for disposal.

MSDS:

<http://www.sciencelab.com/msds.php?msdsId=9925304>

Toxic Properties

Acute effects:

Irritant to eyes, skin and respiratory tract. The lethal dose when delivered intravenously to mice was 180 mg/kg (LD₅₀). MS-222 is a muscle relaxant that operates by preventing action potentials.

Chronic effects:

Not available

Local effects:

Very hazardous in case of skin contact (irritant, corrosive, sensitizer). Hazardous in case of eye contact (irritant) and inhalation and slightly hazardous in case of ingestion.

Systemic effects:

Muscle relaxant – blocks action potentials and neurological signals between the extremities and the brain.

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