Florida State University
Animal Care and Use Committee (ACUC)

Guidelines on Preparation and Storage of Tricaine Methanesulfonate (MS 222)

1.0 Scope and Application

Tricaine methanesulfonate (MS-222, CAS# 886-86-2) is an anesthetic agent used for the sedation, anesthesia, and euthanasia of fish, amphibians, and other aquatic animals. MS-222 is an irritant to the eyes, respiratory system, and skin. Chronic skin exposure has been reported to cause retinopathy. The following guidelines are intended to minimize or prevent the risk to personnel during the preparation and use of MS-222. It is the responsibility of the Principal Investigator to provide these guidelines to research personnel working with MS-222 in their laboratory. All personnel shall read and fully adhere to this SOP when handling Tricaine Methanesulfonate (MS-222).

2.0 Summary

- Use of pharmaceutical grade MS-222 (e.g. Syncaine) is required unless use of a non-pharmaceutical chemical grade product has been requested in the animal use protocol and approved by the FSU ACUC.

- Personnel must wear, at a minimum, nitrile gloves and a lab coat or apron when handling MS-222, whether in a powder form, in solution, or animals exposed to MS-222. If there is a risk of aerosolization, a NIOSH approved respirator is recommended. If there is a high risk of splash, it is recommended that personnel wear splash googles.

- If available, personnel should use a fume hood when weighing MS-222 powder and preparing solutions. If a fume hood is not available or if weighing is complicated by air currents within the fume hood, use a top loading balance with a glass or plastic cover. Proper laboratory techniques should be employed to minimize the chance for aerosolization. A plastic backed absorbent pad should be placed under the work area during preparation and disposed of following preparation. Decontamination following preparation should consist of surface cleaning with water and detergent followed by thorough rinsing. When done, remove gloves and wash hands thoroughly.

- For field work, use of pre-weighed powder or stock amounts in containers prepared in the lab, is preferred. Personnel preparing MS-222 solutions in the field must work in an area downwind and away from others, and wear gloves, protective clothing, and eye protection.

- MS-222 is acidic when in solution and must be buffered resulting in a solution of pH 7.0 - 7.5 before being used in work with animals. MS-222 working solutions must be made up fresh for each use.

- Keep container tightly closed when not in use. Stock solutions should be stored in dark, opaque containers. The solution must be replaced any time a brown color is observed in the liquid. Once mixed, stock solution containers must be properly labeled and dated with an expiration date. It is recommended not to hold MS-222 in a stock solution longer than 7 days unless frozen.[1]

- Stock solutions should be disposed of by diluting with a large amount of water prior to and while pouring down a sanitary drain. Working solutions in the lab should be poured down a sanitary drain with water running. Solutions used in the field should be returned to the laboratory for disposal whenever possible. If laboratory disposal is not possible, extensively dilute the working solution prior to disposal. Do not discard MS-222 solution directly into surface water, storm water conveyances, catch basins or into other natural water sources.

Author: Kathy Harper, DVM, PhD, William A. Hill, DVM, MPH, DACLAM, CPIA, Renee Murray, PhD, CSP
Approval Date: July 31, 2019
Reviewed Date: June 29, 2022
Revised Date: September 22, 2022
Approved Date: October 5, 2022
Reviewed Date: September 24, 2025

[1]The Proper Usage and Holding of Tricaine Methanesulfonate, MS-222, presentation of data from the Pacific Northwest National Laboratory and the United States Army Corps of Engineers