**Guidelines for Preparation and Use of Tricaine Methanesulfonate (MS-222)**

1. **Purpose:**
   Tricaine Methanesulfonate (MS-222) is a popular anesthetic agent used in aquatic species, and is intended for the temporary immobilization of fish, amphibians, and other aquatic, cold-blooded animals.

2. **Policy:**
   Tricaine Methanesulfonate is appropriate for the temporary immobilization of fish, amphibians, and other aquatic, cold-blooded animals. Pharmaceutical grade MS-222 must be used in a buffered solution for all intended uses on live vertebrate aquatic species. Two examples of pharmaceutical grade MS-222 are Finquel and Western Chemical's Tricaine-S.

3. **Procedure:**
   The 2013 AVMA Guidelines for the Euthanasia of Animals states:
   “A 10g/L of stock solution can be made and sodium bicarbonate added to saturation resulting in a pH of 7.0 to 7.5 for the solution.”
   The stock solution should be stored in a dark brown bottle and refrigerated or frozen if possible. The solution should be replaced monthly and any time a brown color is observed. See expiration date on the MS-222 bottle. Stored solutions should be labeled with the expiration date of the powder from the parent bottle.
   “MS-222 is an acceptable method of euthanasia for finfish and some amphibians and reptiles. When used for large finfish and some amphibians (eg, Xenopus spp.), a secondary method should be used to insure death.”

4. **Methods of Application:**
   a) General anesthesia: For most situations where rapid or moderately rapid anesthesia is required, MS-222 may be applied in a bath. The container may be made of glass, plastic, steel, aluminum or other suitable material and must be large enough so that the animals are not overcrowded.
   b) Surgery and physiologic studies: The fish may be anesthetized to loss of reflex, removed from the bath and positioned so that the gills are bathed in a sedating concentration of MS-222.

5. **Dosage:**
   Western Chemical, Inc. has a guide and treatment calculator available on its website. You are encouraged to discuss proposed dosages with the Einstein Veterinary staff during the protocol approval process.

6. **Safety:**
   Follow directions from EH&S for disposal. Safe practices include:
   - Wear protective clothing, gloves and goggles when handling the MS-222 powder.
   - Work inside a fume hood to prepare the solution.
   - Wear gloves and use a utensil to stir until all powder is dissolved.
- Wear gloves when handling animals exposed to MS-222
- Do not discard MS-222 directly into the sink.

7. Disposal:

Tricaine can be collected in a bottle, a hazardous waste label must be placed on it and the waste form sent for pick up.


Hazardous waste label:

http://einstein.yu.edu/images/administration/environmental-health-safety/waste-label.jpg

Hazardous waste form: