



Disinfecting Aquariums and Equipment for the Classroom Aquarium Education Program

(1/2024)



Introduction

As a participant in the Classroom Aquarium Education Program, you are required to thoroughly clean the aquarium and other related equipment that touch the aquarium water to reduce the potential for pathogens and aquatic invasive species to exist in the aquarium.

To protect the health of the eggs and fish, the aquarium and all equipment must be disinfected at the start of the program (before receiving eggs), and again at the end of the program (after releasing fry) to remove bacteria, fungus, and any other organisms.

Aquarium Cleaning Procedure

1. Dry clean all the equipment

Remove all dirt from the rocks, aquarium, and related equipment. Clean as much dirt and organic matter as possible with tap water. Do not use soap or other chemicals. Organic "dirt" such as fish poop and rotting fish food can drastically reduce the germicidal effectiveness of the bleach you will use on the equipment.

2. Boil gravel and rocks

The rocks will not need to be treated with bleach. Instead, the rocks should be boiled to avoid introducing any parasites, pathogens, or aquatic invasive species to the aquarium from the rocks and gravel you will be using. Boiling the rocks and gravel for 10-20 minutes in regular tap water that is at a rolling boil should kill any unwanted pathogens. CAUTION—rocks stay hot for a very long time. Let them cool before you handle them. Spread rocks on a clean surface in the sun to finish drying.

3. Make the bleach solution

Sodium hypochlorite is the active ingredient in household or chlorine bleach. Bleach is a solution of sodium hypochlorite (NaOCl) and water (see pages 2-5).

4. Soak all equipment in bleach solution

Add bleach solution to the tank and soak all equipment for at least 1 hour. Fill the aquarium with the bleach solution and put any other equipment you will be using in the aquarium (such as thermometers, filters, and pumps) into the bleach solution. Leave the bleach solution in contact with the equipment for at least one hour.

5. Properly dispose of the bleach solution

Pour bleach solution down a sink or on the ground/lawn away from a watercourse. Thoroughly rinse the bleach solution off the equipment and let equipment dry before setting up your aquarium for the fish or before storing the aquarium at the end of the season.

Making The Bleach Solution

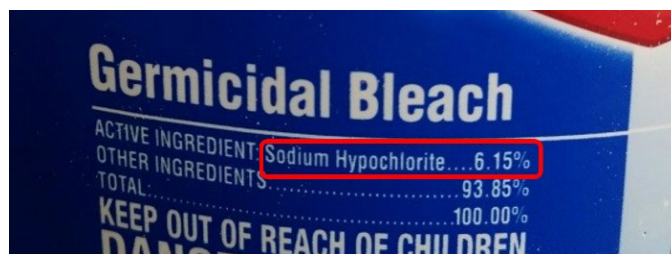
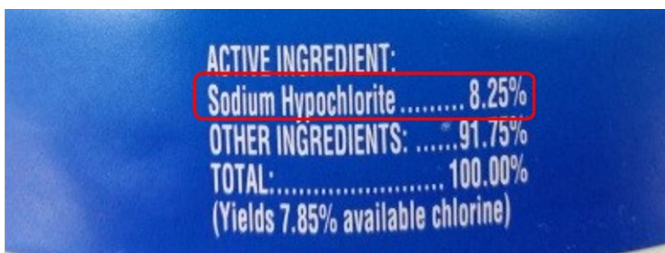
In 2012, some manufacturers, including the Clorox Company, increased their bleach formula to a strength of 8.25% from the former 5.25%. Most “regular” bleach available in the U.S. today is 8.25% sodium hypochlorite.

Some bleach that is sold commercially as a janitorial product, is 6.15% sodium hypochlorite. Thickened or “splashless” bleach has only 1-5% sodium hypochlorite. Scented bleaches may also have lower sodium hypochlorite content. Many types of bleach do not state a percentage on the label.

Read the label on the bleach bottle. It should list the percentage of sodium hypochlorite. Only use bleach that states the percentage of sodium hypochlorite on the label.

Bleach with sodium hypochlorite label

Below are examples of bleaches that have the percentage of sodium hypochlorite. Dilute the bleach according to the percent of sodium hypochlorite.



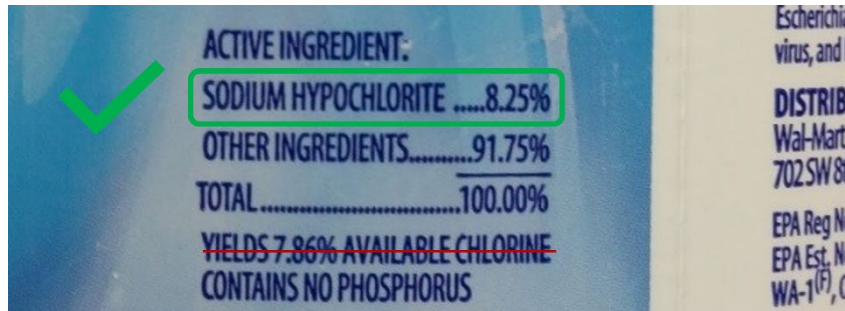
Bleach without sodium hypochlorite labels

Below are examples of bleaches that do not state a percentage of sodium hypochlorite. Do not use these bleaches to clean the equipment since the strength of the solution will be unknown.



Available Chlorine

The percentage of "available chlorine" is one way to indicate the strength of a bleaching agent. It is actually the ratio of the mass of Cl_2 to the mass of the bleach mixture expressed as a percentage. **This is not the percentage we use for determining the bleach dilution used for the aquariums.** Do not use the percentage of available chlorine to calculate the bleach solution. Dilute the bleach according to the percent of sodium hypochlorite.



Bleach has a shelf life

The active ingredient in bleach, sodium hypochlorite, naturally breaks down into salt and water. According to the Clorox Company regarding regular concentrated (8.25%) bleach, the rate of breakdown increases rapidly when bleach is stored in extreme hot or freezing temperatures, or when a bottle is more than one year old from the date of manufacture. Generally, bleach stored at room temperature (~70°F) has a shelf life of one year, but after that point it should be replaced.

According to the Clorox Company, if you don't know when the bleach was purchased and it has no bleach smell, it is too old to use. ***The missing bleach smell indicates that most of the active ingredients have converted to salt and water, and it won't function much as bleach anymore.*** To dispose of it, the Clorox Company suggests that you add it to your toilet bowl and then flush—any small amount of sodium hypochlorite active that may remain will finish breaking down as it travels through your home's pipes and out to the sewer.

Read more at [Diluting Bleach for Cleaning to Avoid Residue | Clorox®](#)

The concentration of the bleach solution

Mark Adkison, Research Scientist Supervisor I for the California Department of Fish & Wildlife, CDFW, recommends a chlorine bleach solution of 200mg/L for fish tanks and the equipment. ***Use only plain, unscented, regular, bleach*** with water in the quantities in the table below.

5.25-6.25% Sodium Hypochlorite

1 teaspoon of bleach for 1 quart of water

4 teaspoons of bleach for 1 gallon of water

8.25% Sodium Hypochlorite

½ teaspoon of bleach for 1 quart of water

1 teaspoon of bleach for 1 gallon of water

The temperature of the bleach solution

The hotter the bleach solution, the more active the chlorine will be against pathogens. Although 120°F is a recommended temperature for the bleach solution, it is very warm and can be uncomfortable to work in, so use the warmest water you can comfortably work with.

The duration of exposure of the equipment to the bleach solution

The chlorine bleach solution should be in contact with the aquarium and equipment for at least one hour.

The bleach solution is very toxic to fish and should be rinsed off very thoroughly before using the equipment with the fish.

Summary

1. Disinfect your tank twice each season: when prepping the tank before receiving eggs, and after releasing the fry.
2. Remove dirt from aquarium, related equipment, and rocks.
3. Boil gravel and rocks in plain water at a rolling boil for 10-20 minutes. Dry them completely before they are stored.
4. Make bleach solution according to the table above. Use the warmest water you can comfortably work with up to 120°F.
5. Fill the aquarium with the bleach solution and put any other equipment you will be using in the aquarium into the bleach solution. Leave the bleach solution in contact with the equipment for at least one hour.
6. Dispose of the bleach solution in a sink or on the ground. Thoroughly rinse the bleach solution off the equipment and let dry before setting up or storing the aquarium.