

# Basics of Freshwater Aquarium Conditioning

There are three different types of freshwater aquarium environments: soft acid water, neutral water, and hard alkaline water. The neutral environment is the most frequently seen because it is the easiest to control, most fish adapt readily to it, and most aquarium pet stores use it. The soft, acid water environment is usually promoted by Discus and Tetra enthusiasts, while the hard, alkaline water is often selected for live-bearers and African cichlids.

The key factor distinguishing these environments is pH. pH is a paradox in that it is both critical and irrelevant. It is irrelevant because fish are for the most part insensitive to it and adapt to just about any reasonable pH, even if it changes rapidly. Trauma apparently due to pH change is often due to related factors, notably ammonia. An aquarium could easily be happily overpopulated at pH 6.8, but, when its zealous keeper makes a water change with pH 9.0 tap water, a drastic pH change occurs. Normally the fish would hardly notice the change except that in this case there has been an accumulation of ionized ammonia which is now being rapidly converted into deadly free ammonia. Alternatively, consider the accumulation of insoluble and invisible copper oxide particles (from copper pipes) in the aquarium. At neutral or alkaline pH, the copper oxide is no more hazardous than quartz rock, but, if the pH drops, this copper will dissolve and quite probably cause trouble that will end up being blamed on a virus. pH control, then, is important with respect to maintaining the delicate balance of this sometimes precarious environment.

A paramount factor in the proper maintenance of an aquarium is the dilution of accumulated waste by scheduled water changes. This requires the removal of

chlorine or chloramine or both from the new water. With the advent of chloramine, thiosulfate has proven inadequate, causing the release of ammonia. At acid or neutral pH, this is not of serious consequence. However, at alkaline pH it can be devastating, particularly if the tap water is heavily chlorinated.

A less well defined factor that appears important is the balanced concentration of essential ions, such as calcium, magnesium, potassium, and sodium. Generally, aquarium water develops an imbalance that leads to subtle but clearly unhealthy osmotic stress. Most fish can adapt to this, but they are vulnerable when stressed by relocation, chill, or the trauma of being in a plastic bag.



An important factor, often overlooked when first setting up the aquarium, is the selection of bottom substrate. It is important to select a substrate that is inert. Before investing a lot of time and money on a selected substrate, test it by rinsing it and then soaking a handful in about a cup of distilled water for a few days. If the substrate is inert it will not alter the pH of the water. Distilled or deionized water should have a pH of about 6.2, depending on the carbon dioxide it contains. If the substrate alters the pH of the water, it will probably do the same for your aquarium. Do not assume that a coated gravel is inert. With an inert gravel, you will be able to control pH with relatively modest doses of buffer, but, with a pH altering gravel, you will have to use much higher and more frequent dosing to achieve stable pH control.

Neutral Regulator® is designed for the neutral water environment. Used regularly with water changes, aquarium pH will always be neutral and free of chlorine, chloramine, and ammonia; essential ions will

be balanced, and a conditioner will promote long term water clarity. With very hard water, a precipitate of calcium may form, which should be allowed to settle and then removed to keep the water soft. This is an economical way to gradually soften the aquarium water, even with a very hard native water source. Neutral Regulator™ contains no carbonates or bicarbonates. In a neutral freshwater environment, bicarbonate is not an efficient buffer unless coupled with carbon dioxide injection.

Discus Buffer® is designed to lower the pH and soften water for soft acid water environments. It will not remove chlorine or chloramine. It may, however, be combined with Neutral Regulator™ in order to achieve chlorine/chloramine removal and also to target a specific pH. Discus Buffer™ will produce acid water without discoloring the water. So called “dark water” is dark from tannins and phenols, both of which, in the confines of an aquarium, can be hazardous to fish. Dark water is unnecessary and undesirable for maintaining soft acid water.

Acid Buffer™ is a non-phosphate buffer designed to lower pH and buffer at acid pH where phosphates may pose a problem. Alkaline Buffer™ is a non-phosphate buffer intended to raise pH or buffer between 7.4 and 8.3. Used together, they can achieve any target pH in the range of 5.0 to 8.0. Seachem’s non-phosphate buffers are designed for both soft and hard waters and are ideal for planted tanks or those with persistent algae problems. Competing non-phosphate buffers use “hydrocarbonate” or “carbonic acid monosodium salt”, in other words, sodium bicarbonate or baking soda. Seachem’s Flourish™ and Flourish Tabs™ are both excellent products for adding nutrients to stimulate the growth of freshwater plants without supporting problem algae growth.

Cichlid Lake Salt™ is a scientific blend of dose-specific salts that faithfully simulate the different rift lakes of Africa. Malawi/Victoria Buffer™ buffers between pH 7.8 and 8.3, depending on dosing. Tanganyika Buffer™ buffers at 9.2. These products are also very useful for

any hard water cichlids and other hard water fish, including those native to brackish waters.

Prime® is a liquid total conditioner for removing chlorine, chloramine, and ammonia. It also protects from nitrite. Unlike competing products, it does so without lowering pH. It provides essential ions and slime coat protection. Safe™ is a dry product, supplied in a handy dispensing vial, that performs the same primary functions as Prime™. AmGuard™ is a versatile ammonia remover that is useful in emergencies and setting up new tanks. Overdosing with AmGuard™ should be avoided.

StressGuard™ is an exceptionally concentrated slime coat that is unequaled by any other. It is a natural polymer coat that shields fish from bacterial, fungal, and viral infections. It decreases stress and reduces the toxicity of ammonia. Unlike competing products, it is not a polyelectrolyte that can adversely alter pH and ionic balance. Just ask your dealer to let you feel the texture of StressGuard™. It also works great in marine water.