

Simple Water Chemistry

kH pH Buffering - A Constant State of Crashing

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A constant State of Crashing

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Introduction

Water Chemistry is a difficult subject. If you are a chemist or PHd student of water, please accept our apologies for the Head Squared style. Here we believe in simple, down to earth knowledge for all. If you feel something is missing, please feel free to email me direct at aquatics@headsquared.co.uk.

The Use of Fresh Water in a Pond

In a recirculation system (such as a pond with a filter where water is reused constantly) our fish and plants are reliant on our ability to manage the system, to be healthy. It is our responsibility as pond keepers to correctly manage the ponds ecosystem. If we do not understand water in some basic ways, we may fail in this task.

Water that comes from a mains supply (for example, water from a hose or a tap/faucet) is supplied with minerals and other goodness needed to sustain life. Our fish and plants will use up this goodness whilst surviving and growing. It is for this reason water can be described as being in a constant state of crashing. As soon as fresh water is supplied to our pond, the living organisms will start to consume the goodness we have provided and its quality will reduce. Water, like any other environment, can become stale (stagnant) if we do not refresh these necessary minerals by adding new water. It is for this reason that it is generally advised to refresh around 10% of the water in a pond per week.

As long as fresh water is being included into pond systems, many filter and pond management mistakes can be made without any major problems being seen. This is why many articles advise fresh water as a first action if fish and pond life are struggling. This fresh water will dilute ammonia and nitrites and will also include these necessary minerals back into the system.

pH Fluctuations

We must then look at the stability of our water. It is surprising that many aquatic inhabitants can live in a vast range of pH (acidity/alkalinity) as long as this is constant. Fluctuations of pH are seen to be a larger problem and something we can have some control over. Large pH fluctuations can cause many illnesses or stress in our pond inhabitants and in some scenarios death if the swing (from Acid to alkaline or visa versa) is quite large. Large pH fluctuations can also kill the bacteria we nurture in our filters to keep the water biologically clean.

Buffering

This is where we really stretch the imagination to explain buffering. Fluctuations in pH cannot happen if our water is buffered. Buffering is a basic description of how hard our water is. If water is hard, it is high in calcium carbonate (calcium carbonate causes scaling in our washing machines and kettles). The higher the calcium carbonate content in our water, the lower chance we have of pH fluctuations. People living in hard water areas may experience other pond problems but pH will usually be static.

A description of buffering for dummies – If one imagines a pier running into the sea with open sides and a little boy on a bike. The centre of the pier is a static pH level. As long as the child stays on the centre line (pH stability) the pH will not change. If the child falls over the edge, this is described as pH crashing in either direction. If we buffer our water (add calcium carbonate) we effectively place a barrier along the edge of the pier. The child can try to cycle over the edge (crash) but the barrier will keep him/her safe and continuing along the safe line of the pier (pH stability). Buffering is the same. By adding calcium carbonate in soft water areas (or already having it in hard water areas) we control our pH and force it to be static.

Conclusion

The reason this is so important is because of other things we may include into our water. Food for the fish can cause pH swings if water is not buffered. Using chemicals to control blanket weed or green water can also have an effect. Always read the label when using chemicals as they may request kH or carbonate hardness be tested before using certain products. Buffered water is so simple yet can be so important. Check your kH levels with a test kit now!! [Head Squared](#) can provide complete test kits at extremely reasonable prices.

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