Determining the Carbonate Hardness (KH) variations between Marine Buffers

INTRODUCTION

Carbonate Hardness, KH, is one of the most important water parameters of the saltwater aquarium and a building block for reef development. KH is the concentration of carbonate and bicarbonate ions dissolved in water. These ions bond with dissolved minerals, such as calcium and magnesium, and act as pH buffers. The pH buffering capacity of water is its ability to neutralize acid and resist pH fluctuation. The higher the KH, or buffering capacity, the more stable the pH because there are more carbonate and bicarbonate ions available to neutralize acids. KH is measured in degrees or mg/L and it is important to keep the KH at the recommended level of 8°-10° (143-179 mg/L) to ensure pH equilibrium and maintain proper coral growth. Calcium is often referenced as the most essential element for reef aquariums; however, without the appropriate KH level no coral growth can occur. The major building block of reefs is actually calcium carbonate, a combination of calcium and carbonate. Only when KH and calcium are measured together in a saltwater aquarium can hobbyists determine if water parameters are correct.

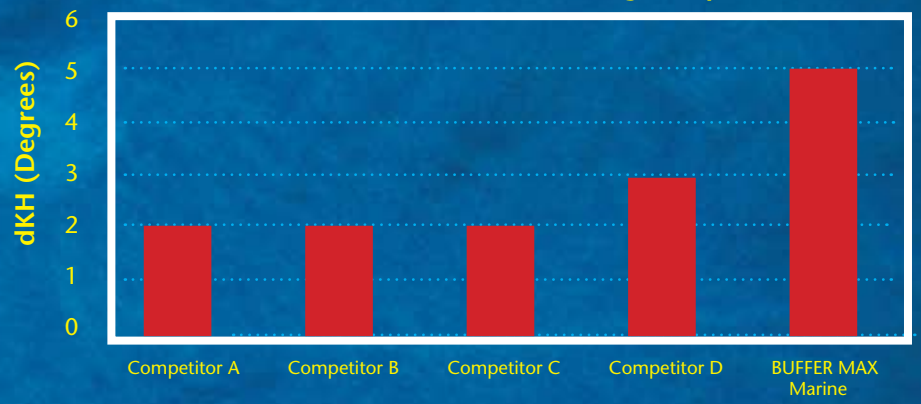
METHODS

- Deionized (DI) water with a KH of 0º was used to provide a comparable starting point.
- One liter of DI water was treated with the recommended dose of BUFFER MAX™ Marine. The KH was tested using the API™ KH Test Kit after dissolution of the buffer.
- The recommended dose of Competitors A, B, C, and D were each added to one liter of DI water. The KH was tested using the API KH Test Kit after dissolution of the buffer.

AIM

To determine the effect of BUFFER MAX Marine on KH compared with Competitors A, B, C, and D.

The Amount of KH Concentration Added by BUFFER MAX Marine and Leading Competitors



RESULT

The KH increased by 5° using BUFFER MAX Marine, only 2° using Competitor A, B, and C, and 3° using Competitor D.

DISCUSSION

KH is an important measure of saltwater quality. KH directly affects the stability of pH in an aquarium. pH is the measure of acidity or alkalinity of water and is affected by chemicals and chemical reactions in an aquarium. These can be introduced in the aquarium through several different sources, with respiration, nitrification, and fish waste being the most common. When KH is limited, the ability of corals and other reef building invertebrates to grow is compromised.

KH can be increased through several means: addition of a buffer, water change with correctly buffered saltwater, or the addition of a Kalkwasser, calcium hydroxide, solution. Of the three, the addition of the buffer is the simplest. BUFFER MAX Marine increases the KH concentration by 5° while the other competitors only increase the KH by 2° - 3°. This higher KH addition means greater pH stabilization and resistance to fluctuations that naturally occur in an aquarium.

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