LAB PROFESSIONAL en

KH

For the titrimetric determination of the carbonate hardness in marine and freshwater aquariums
Visual method of color change

Definition

This test is designed to determine the carbonate hardness (KH) in marine and freshwater aquariums in the range of 1 to 15 °dKH (German Degree of Carbonate Hardness).

Carbonate hardness indicates the concentration of hydrogen carbonate salts of the alkaline earth ions mainly occurring as calcium and magnesium. Carbonate hardness is also known as alkalinity, because the buffer capacity of water depends on the hydrogen carbonate ions. They stabilize the pH value and intercept fluctuations caused by biological processes and CO_2 consumption. Carbonate hardness below 5 °dKH leads to sudden drop in acidity (severe pH fluctuation) which can be life-threatening for many organisms. If the carbonate hardness is too high calcareous precipitation can occur which can negatively affect coral growth and induce growth of algae.

Method

The determination is carried out by titration with hydrochloric acid. The used mixed indicator changes its color at a pH of 4.3. The change of color shows the endpoint of the titration.

Reagents

The reagents are ready for use and have a shelf life until the printed expiry date. Store reagents at +15 ... 25 °C and protected from direct light at the dark.

Number of Determinations

The content is sufficent for approximately 60 analyses.

Resolution/measuring accuracy: 1 drop corresponds to 1 °dKH.

Risks and Safety

Please observe the necessary precautions for use of laboratory reagents. Applications should be performed by expert personnel only. Follow the national and laboratory internal guidelines for work safety. Wear suitable protective clothing and disposable gloves while handling.

SDS ID International
www.sds-id.com

For additional safety information please refer to the information on the label and the corresponding Safety Data Sheet (SDS).
Download by QR-Code or link: www.sds-id.com/100161-8,100162-7

Content

073030-6001	**KIT**	**KH Carbonate Hardness; consists of:**		
073031-0010	KH1	1×	10 mL	Reagent KH1 (Indicator)
073032-0030	KH2	1×	30 mL	Reagent KH2 (Titration solution)
		1×		Syringe 5 mL
		2×		Testing vial

Reference Range

The optimal carbonate hardness of marine aquariums varies from 7 to 10 °dKH. *1)

Application

Preparation

Use fresh aquarium water for analysis. *2)

Rinse the testing vial several times with the sample water to be tested.

Procedure

Hold the dropper bottle vertically while adding drops. Close reagent bottle immediately after use.

- Use the enclosed syringe to fill the testing vial with exactly **5 mL** of the aquarium water. *3)
- Add **2** drops of reagent **KH1** and mix well by shaking briefly. The color changes to blue.
- Add reagent **KH2** dropwise. Mix the solution sufficiently after each drop by rotation movement. Count the number of drops needed until the color changes.

Procedure chart:	
Sample:	**5.00 mL**
Mix. The solution turns to blue.	
Reagent KH1:	**2 drops**
Reagent KH2:	**X. drops**
Mix well after each drop.	
Color change from blue to yellow.	

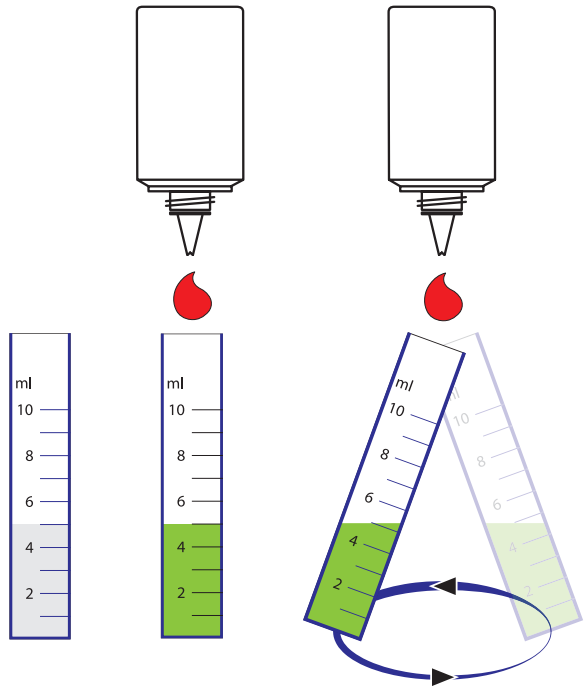

Bild 1 **Bild 2** **Bild 3**

To make sure the color change does not occur delayed at end of the titration wait shortly after each drop added.

Place the testing vial in front of a white background or on a white piece of paper in order to see the color change more clearly.

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To assure that the actual endpoint of the titration is reached add an additional drop to the sample. If the color does not change for 30 seconds the titration is finished (the additional drop is not counted).

For more precise results

To increase the accuracy of the test 10 mL of the sample water can be used. Perform the procedure as described above. The accuracy then increases to 0.5 °dKH per drop.

Analysis

At 5 mL sample volume

X Drops = X °dKH

X Drops = number of drops required until color change.

At 10 mL sample volume

X Drops / 2 = X °dKH

X Drops = number of drops required until color change.

The following conversions are applicable:

	German Degree of Carbonate Hardness °dKH	mmol/L HCO_3^-	mg/L HCO_3^-
1 German Degree of Carbonate Hardness °dKH	1	0.357	21.781
1 mmol/L HCO_3^-	2.801	1	61.017
1 mg/L HCO_3^-	0.046	0.016	1

Notes

This product information exclusively relates to the product described in this leaflet. In particular, this product information cannot be applied to similar reagents from other manufacturers.

Instructions for Use

Close reagent bottle immediately after use, avoid touching the dropper.

Rinse testing vial and syringe with distilled water.

Solutions containing dyes are subject to a limited shelf life. If the test results deviate strongly from the expected results the test should be reviewed with a reference solution.

Support / Information service

For methodological and technical support, please contact us by E-Mail at support@bioanalytic.de (German, English).

Periodically check for updates of this product information on our website.

Feedback

Information from users can be reported to support@bioanalytic.de (German, English).

Suggestions for further developments will be considered.

Waste Management

Please observe your national laws and regulations.

Used and expired solutions must be disposed of in accordance with your local regulations.

Inside the EU, national regulations apply that are based on the current, amended version of Council Directive 67/548/EEG on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.

Decontaminated packaging can disposed of as household waste or recycled, unless otherwise specified.

Literature & Footnotes

Legends for the graphic symbols and tags used follow relevant norms or are available on our internet pages.

*1) These informations only serve as general orientation which cannot be applied on every aquarium. See relevant literature for further information.

*2) Rinse testing vial with distilled water after use. Store testing vial dry and dust free.

*3) The precision of the volume is substantial for the accuracy of the measuring result. The expire date printed on the blister package of the syringe refers to the sterility and has no relevance to the measuring result.

Nomenclature:

The hardness of the water is specified as follows:

°dH = **G**rad **d**eutsche **H**ärte
= German degrees of hardness.

This specification refers to the total hardness of the water.

To distinguish from the pure carbonate hardness, the total hardness it is sometimes indicated as

°d**G**H = Grad deutsche **G**esamt-Härte
= German degrees of **total** hardness.

For an indication of the pure carbonate hardness (older German spelling = Karbonathärte) as follows:

°d**K**H = Grad deutsche **K**arbonathärte
= German degrees of carbonate hardness; or

°d**C**H = Grad deutsche **C**arbonathärte
= German degrees of carbonate hardness.

In addition, there is also the non-carbonate hardness. This is sometimes also referred as sulfate hardness. It comprises in addition to sulphates but also chlorides, nitrates, phosphates and silicates.

°d**N**KH = Grad deutsche **N**icht-Carbonat-Härte
= German degrees of **n**on-carbonate hardness.