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# *visocolor*® *HE* Calcium CA 20

**Test kit for the determination of calcium hardness in water**

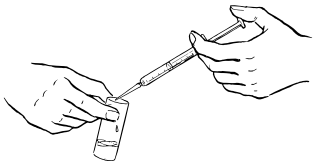
## Method:
Complexometric titration

## Contents of test kit (*refill pack):
sufficient for 200 tests with an average hardness of 10 °d

25 ml sodium hydroxide solution 10%*
10 ml indicator solution CA 20*
100 ml titration solution TL CA 20*
1 test tube with ring mark
1 titration syringe 0-20 °d resp. 0-3.6 mmol/l
(1 graduation mark ≙ 0.5 °d resp. 0.1 mmol/l)
2 plastic dropping tips

## Hazard warning:
Test kit contains sodium hydroxide solution 10%.
**Causes severe burns.** In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable gloves and eye/face protection. For further information ask for a safety data sheet.

## Procedure:
1. Rinse test tube several times with the test sample and fill to ring mark.
2. Add **2 drops** sodium hydroxide solution 10% and shake. The test sample can get turbid.
3. Add **2 drops** indicator solution CA 20 and shake. The test sample turns **red**. If sample turns blue, no calcium is present (0 °d).
4. Put dropping tip onto the titration syringe, press down plunger, dip the tip into the titration solution TL CA 20 and draw up plunger slowly, until the lower rim of the black plunger O-ring agrees with value 0 on the barrel scale. The small air pocket below the plunger tip does not disturb the determinaton.
5. **Addition of the titration solution:** We recommend taking the syringe in the left hand and the test tube in the right hand (see drawing) and adding titration solution dropwise while smoothly shaking the test tube. As soon as the red colour turns lighter, drop more slowly until the solution turns completely **blue**.



If the test solution turns grey after 15-30 s, add dropwise titration solution TL CA 20 until colour change repeats to blue.

Read off calcium hardness in °d or mmol/l from the syringe barrel (lower rim of the black plunger O-ring). Colour change is followed easily when holding test tube before a light background (e.g. sheet of white paper).

6. If the first syringe filling isn't enough to reach colour change (calcium > 20 °d), fill syringe once more with solution TL CA 20 and titrate to colour change (as above). Read off calcium hardness as described before and add for each used syringe filling 20 °d.

This method can be applied also for the analysis of sea water after dilution (1+4) and using 6 drops of sodium hydroxide solution instead of 2 drops.

## Disposing of the samples:
The used analysis specimens can be flushed down the drain with tap water and channelled off to the local sewage treatment works.

## Remark:
The magnesium content is the difference between total hardness (*VISOCOLOR*® *HE* Total Hardness H 20 F, Cat. No. 915 005) and calcium hardness.

1 °d = 1.25 °e = 1.78 °f = 17.8 mg/l $CaCO_3$ = 10 mg/l CaO
1 mmol/l = 2 mval/l = 5.6 °d = 40.1 mg/l Ca

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