

Test kit for performing titrimetric tests on total hardness in surface water and sewage

## Method:

## Complexometric titration

Magnesium and calcium ions, which cause hardness, are combined by the complexing agent EDTA to form chelates. The test is carried out by titration using a metal indicator which changes color when all of the hardness-producing substances have combined.

## Contents:

sufficient for 110 tests at an average hardness of 10 °d

- 8 mL GH-1
- 2 x 30 mL GH-2
  - 1 specimen jar with ringed markings
    1 plastic syringe 5 mL
    1 instructions for use

### Hazard warning:

Information regarding safety can and in the safety data sheet. You www.mn-net.com/SDS. an be found on the box' label You can download the SDS from

#### Instructions for use:

- Pour a 5 mL water sample into the specimen jar using the plastic 1. syringe.
- 2. Add 2 drops of GH-1 and shake the jar to mix the contents. The water sample turns red. If the water sample turns green, this means that there are no hardness-producing substances.
- Hold the dropping bottle **GH-2** absolutely vertical and add GH-2 drop by drop, shaking the specimen at the same time to mix until it turns **green**. Count the number of drops. One drop corresponds to 3. one degree of total water hardness (°d).
- 4. After use, rinse out the specimen jar thoroughly.
- 5. Seal the dropping bottles immediately after use. Do not touch the dropping pipettes.

This method can be applied also for the analysis of sea water after dilution (1+29).

### Disposing of the samples:

Information regarding disposal can be found in the safety data sheet. You can download the SDS from *www.mn-net.com/SDS*.

# Interferences:

Copper(II) ions may delay the indicator change or even block this change if higher levels are present. Therefore, in the case of copper pipes, let the water run for a sufficient amount of time before taking the sample.

## **Conversion table:**

°d	°e	°f	mg/L CaO	mg/L CaCO₃	mmol/L
1	1.3	1.8	10	18	0.18
2	2.5	3.6	20	36	0.36
3	3.8	5.4	30	54	0.54
4	5.0	7.1	40	71	0.71
5	6.3	8.9	50	89	0.89
6	7.5	10.7	60	107	1.07
7	8.8	12.5	70	125	1.25
8	10.0	14.3	80	143	1.43
9	11.3	16.1	90	161	1.61
10	12.5	17.8	100	178	1.78

#### Notes:

For the determination of total hardness in the presence of copper ions, please contact MACHEREY-NAGEL for special working instructions. The test kits VISOCOLOR® ECO total Hardness and VISOCOLOR® ECO Calcium (REF 931012) can be used also for the determination of

magnesium: [total hardness in mmol/L - calcium hardness in mmol/L] x 24.3 = mg/L Mg<sup>2</sup>

Storage:

Store the test kit in a cool (< 25 °C) and dry place.