

HARDNESS (HARDICOL)

Photometer Method

**AUTOMATIC
WAVELENGTH
SELECTION**

**TEST FOR HARDNESS IN
NATURAL AND TREATED WATERS**

0 – 500 mg/l CaCO₃

Water hardness is caused by the presence of calcium and magnesium salts. High levels of hardness prevent the formation of lather with soap, and can cause scaling in water systems - particularly boilers, heat exchangers and steam generating plant. Hardness is an important control test in a wide variety of applications.

The Palintest Hardness test provides a simple method of checking water hardness over the range 0 - 500 mg/l CaCO₃.

Method

The Palintest Hardicol test is based on a unique colorimetric method. The reagents are provided in tablet form and the test is carried out simply by adding the appropriate tablets to a sample of the water.

Under the controlled conditions of the test calcium and magnesium ions react with Hardicol indicator to produce a purple coloration. The intensity of the colour is proportional to the total hardness of the water and is measured using a Palintest Photometer.

Reagents and Equipment

Palintest Hardicol No 1 Tablets

Palintest Hardicol No 2 Tablets

Palintest Automatic Wavelength Selection Photometer

Round Test Tubes, 10 ml glass (PT 595)

Test Procedure

- 1 Filter sample if necessary to obtain a clear solution.
- 2 Fill test tube with sample to the 10 ml mark.
- 3 Add one Hardicol No 1 tablet, crush and mix to dissolve.
- 4 Add one Hardicol No 2 tablet, crush and mix to dissolve. Ensure all particles are completely dissolved.
- 5 Stand for two minutes to allow full colour development.
- 6 Select Phot 15 on the Photometer.
- 7 Take Photometer reading in the usual manner (see Photometer instructions).
- 8 The Total Hardness result is displayed as mg/l CaCO₃.

Interferences

- 1 Unusually high levels of iron (above 10 mg/l) will cause low results for total hardness.
- 2 The pH required in the test is closely controlled by a buffer mixture included in the tablet formulation. However, to avoid exceeding the buffer capacity strongly acid or alkaline samples should be adjusted to within the pH range 4 to 10, prior to the start of the test.

Notes

- 1 The expression of hardness results sometimes causes confusion. It is normal practice to express the result of hardness tests as mg/l CaCO₃ (calcium carbonate). This is merely a convention to allow the comparison of different results and does not necessarily indicate that the hardness is present in the water in this form.
 - 2 This test measures total hardness. For the specific measurement of calcium hardness or magnesium hardness refer to the Palintest Calcicol (PHOT.12) and Magnecol (PHOT.21) tests respectively.
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