Total Hardness Test Kit

1 to 20 mg/L and 1 to 20 gpg (17 to 342 mg/L) as $CaCO_3$

For test kit 145201 (HA-71A) DOC326.98.00002

Additional copies available on www.hach.com

Test preparation

- Rinse labware with deionized water between tests.
- When titrating, count each drop of titrant. Hold the dropper vertically. Swirl after each drop is added.

CAUTION: Handle chemical standards and reagents carefully. Review Material Safety Data Sheets for safe handling, storage and disposal information.

Required items

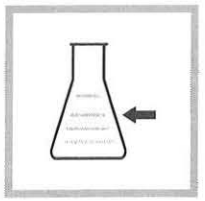
Description	Unit	Catalog no.
Bottle, square mixing	6/pkg	43906
Flask, Erlenmeyer, 125-mL	each	50543
Hardness 1 Buffer Solution	100 mL MDB[1]	42432
Hardness 2, ManVer® 2 hardness indicator	100 mL MDB[1]	42532
Hardness 3 Titrant Reagent	100 mL MDB[1]	42632
Measuring Tube, plastic, 5.83 mL	each	43800

[1] Marked dropping bottle

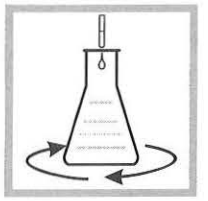
Optional items

Description	Unit	Catalog no.
Deionized Water	500 mL	27249
Hardness Standard Solution, 20 gpg as $CaCO_3$	500 mL	47949

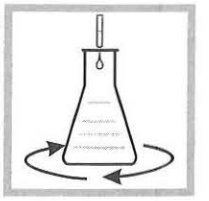
Low range (1 to 20 mg/L) test procedure



1. Fill the flask to the 100-mL mark with sample.

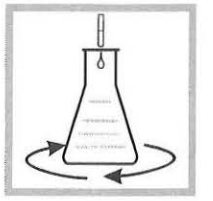


2. Add 2 mL of Buffer Solution, Hardness 1 to the flask. Swirl to mix.



3. Add four drops of Hardness 2 Indicator. Swirl to mix.

A blue color indicates soft water. If a red color develops, proceed to step 4.



4. Add Hardness 3 Titrant Reagent by drops. Count the drops until the color changes from red to blue. Swirl to mix after each drop.

5. Calculate the results. Each drop of Hardness 3 Titrant Reagent equals 1 mg/L as calcium carbonate ($CaCO_3$).

High range (1 to 20 gpg (17 to 342 mg/L)) test procedure

1. Fill the plastic measuring tube to the top with sample.

Pour the sample into the bottle.

2. Add three drops of Buffer Solution, Hardness 1 to the mixing bottle. Swirl to mix.

3. Add one drop of Hardness 2 Indicator to the mixing bottle. Swirl to mix.

A blue color indicates soft water. If a red color develops, proceed to step 4.

4. Add Hardness 3 Titrant Reagent by drops. Count the drops until the color changes from red to blue. Swirl to mix after each drop.

5. Calculate the results. Each drop of Hardness 3 Titrant Reagent equals 1 grain per gallon hardness as calcium carbonate ($CaCO_3$). One grain per gallon (gpg) equals 17.1 mg/L.

For technical assistance or ordering information: visit www.hach.com, call 800-227-4224 or email techhelp@hach.com Edition 1, August 2006