



# CALCIUM HARDNESS KIT FOR FRESH OR SALT WATER

DIRECT READING TITRATOR

CODE 3609-01

QUANTITY	CONTENTS	CODE
15 mL	*Sodium Hydroxide Reagent w/Metal Inhibitors	*4259-E
50	Calcium Hardness Indicator Tablets	5250A-H
60 mL	Hardness #7 Reagent	4487DR-H
1	Test Tube, 5-10-12.9-15-20-25 mL, glass, w/cap	0608
1	Direct Reading Titrator, 0-200 Range	0382
1	Pipet, 0.5 mL, plastic	0353

\*WARNING: Reagents marked with an \* are considered to be potential health hazards. To view or print a Safety Data Sheet (SDS) for these reagents go to [www.lamotte.com](http://www.lamotte.com). Search for the four digit reagent code number listed on the reagent label, in the contents list or in the test procedures. Omit any letter that follows or precedes the four digit code number. For example, if the code is 4450WT-H, search 4450. To obtain a printed copy, contact LaMotte by email, phone or fax.

Emergency information for all LaMotte reagents is available from Chem-Tel (US, 1-800-255-3924) (International, call collect, 813-248-0585).

To order individual reagents or test kit components, use the specified code number.

NOTE: Read the LaMotte Direct Reading Titrator Instruction Manual before proceeding. The Titrator is calibrated in terms of hardness expressed as parts per million (ppm) calcium carbonate ( $\text{CaCO}_3$ ). Each minor division on the Titrator scale equals 4 ppm  $\text{CaCO}_3$ .

WARNING! This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision

## PROCEDURE

### CALCIUM HARDNESS [FRESH WATER]

1. Fill test tube (0608) to 12.9 mL line with sample water.
2. Add 6 drops of \*Sodium Hydroxide Reagent w/Metal Inhibitors (4259). Cap and mix.
3. Add one Calcium Hardness Indicator Tablet (5250A). Cap and gently mix until tablet disintegrates. Solution will turn red if hardness is present. If solution is blue, there is no measurable amount of hardness.
4. Immediately fill the Direct Reading Titrator (0382) with Hardness Reagent #7 (4487DR).

Insert into the center hole of the test tube cap.

5. While gently swirling the tube, slowly depress the plunger to titrate the sample until the red color changes to purple and then to blue. Read the test result directly from the scale where the large ring on the Titrator meets the Titrator barrel. Record as ppm Calcium Hardness as  $\text{CaCO}_3$ .

NOTE: Disregard any color change back to purple after five seconds.

EXAMPLE: Large ring is 3 minor divisions below line 80. Test result is 80 plus (3 divisions x 4) equals 92 ppm.

6. If the plunger reaches the bottom line on the Titrator scale (200 ppm) before the endpoint color change occurs, refill Titrator and continue the titration. When recording the test result, be sure to include the value of the original amount of reagent dispensed (200 ppm).

## **ANALYSIS OF HARDNESS IN SALT WATER**

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When sea and estuarine waters containing very high levels of mineral salts are to be tested, the sample must be diluted before titrating.

### **CALCIUM HARDNESS DILUTION [1 TO 12.9]**

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1. Use the 0.5 mL pipet (0353) to transfer 1.0 mL (two measures) of the salt water sample to the test tube (0608).
2. Dilute to 12.9 mL line with distilled water.
3. Add 6 drops of \*Sodium Hydroxide Reagent w/Metal Inhibitors (4259). Cap and mix.
4. Add one Calcium Hardness Indicator Tablet (5250A). Cap and gently mix until tablet disintegrates. Solution will turn red if hardness is present. If solution is blue, there is no measurable amount of hardness.
5. Immediately fill the Direct Reading Titrator (0382) with Hardness Reagent #7 (4487DR). Insert into the center hole of the test tube cap.
6. While gently swirling the tube, slowly depress the plunger to titrate the sample until the red color changes to purple and then to blue. Read the test result directly from the scale where the large ring on the Titrator meets the Titrator barrel. Multiply by 5.16. Record as ppm Calcium as  $\text{Ca}^{++}$ .

NOTE: Disregard any color change back to purple after five seconds.

EXAMPLE: Large ring is 3 minor divisions below line 80. Titrator reading is 80 plus (3 divisions x 4) equals 92. Multiply by 5.16. Test result is 474.72.

7. If the plunger reaches the bottom line on the Titrator scale (200 ppm) before the endpoint color change occurs, refill the Titrator and continue the titration. When recording the test result, be sure to include the value of the original amount of reagent dispensed (200 ppm).

## **LaMOTTE COMPANY**

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