YaliTech
Yalitech Instruments
Santiago de Chile, Río Refugio 9648, Parque de Negocios ENEA, Pudahuel.
www.yalitech.cl · ventas@yalitech.cl · (+56 2) 28988221

TOTAL, CALCIUM & MAGNESIUM HARDNESS KIT

DROP COUNT, FRESH & SALT WATER

CODE 4824-LT-02

QUANTITY	CONTENTS	CODE
15 mL	*Sodium Hydroxide Reagent w/Metal Inhibitors	*4259-E
50	Calcium Hardness Indicator Tablets	5250A-H
15 mL	*Hardness Reagent #5	*4483-E
50	Hardness Reagent #6 Tablets	4484A-H
60 mL	Hardness Reagent #7	4487WT-H
1	Test Tube, w/cap	4488
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. 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.

TEST PROCEDURES

TOTAL HARDNESS

1. Fill the test tube (4488) to the desired line with sample water.

   To receive results in ppm, fill tube to upper line.
   To receive results in gpg, fill tube to middle line.
   If the hardness level is above 200 ppm, fill tube to lower line.

NOTE: 1 gpg = 17.1 ppm

2. Add five drops of *Hardness Reagent #5 (4483). Swirl to mix.
3. Add one Hardness Reagent #6 Tablet (4484A). Swirl to dissolve tablet. Solution will turn red if hardness is present. If solution is blue, there is no measurable amount of hardness.
4. While gently swirling tube, add Hardness Reagent #7 (4487WT), one drop at a time until color changes from red to clear blue. Count the number of drops added. Hold dropper bottle vertically.
5. To determine total hardness test result, multiply the number of drops added in Step 4 by:

lower line	**20 ppm $CaCO_3$**
middle line	**1 gpg $CaCO_3$**
upper line	**10 ppm $CaCO_3$**

CALCIUM HARDNESS

1. Fill test tube (4488) to the desired line (see Step 1, in Total Hardness) with sample water.
2. Add 6 drops of *Sodium Hydroxide Reagent w/Metal Inhibitors (4259). Swirl to mix.
3. Add one Calcium Hardness Indicator Tablet (5250A). Swirl to dissolve tablet. Solution will turn red if hardness is present. If solution is blue, there is no measurable amount of hardness.
4. While gently swirling tube, immediately add Hardness Reagent #7 (4487WT), one drop at a time until color changes from red to clear blue. Count the number of drops added. Hold dropper bottle vertically.
5. To determine calcium hardness test result, multiply the number of drops added in Step 3 by:

lower line	**20 ppm $CaCO_3$**
middle line	**1 gpg $CaCO_3$**
upper line	**10 ppm $CaCO_3$**

ANALYSIS OF HARDNESS IN SALT WATER

When sea and estuarine waters containing very high levels of mineral salts are to be tested, the sample must be diluted to a practical concentration before titration. This kit is supplied with a calibrated pipet for performing the dilutions described below.

TOTAL HARDNESS DILUTION (1 TO 17.2)

1. Use the 0.5 mL pipet (0353) to transfer 0.5 mL of the salt water to be tested to the test tube (4488).
2. Fill tube to 10 ppm line with distilled water.
3. Follow Steps 2 through 4 under the Total Hardness test procedure. Multiply the number of drops by 172 to obtain the test result expressed as Total Hardness in ppm $CaCO_3$.

CALCIUM HARDNESS DILUTION (1 TO 8.6)

1. Use the 0.5 mL pipet (0353) to transfer 1.0 mL (two measures) of the salt water to be tested to the test tube (4488).
2. Fill tube to 10 ppm line with distilled water.
3. Follow Steps 2 through 4 under Calcium Hardness test procedure.
4. Multiply the number of drops by 86 to obtain the test result expressed as Calcium Hardness in ppm $CaCO_3$.

NOTE: Calcium Hardness test result may be converted to ppm Calcium Chloride ($CaCl_2$) by means of the following formula:

ppm $CaCl_2$ = ppm $CaCO_3$ x 1.11

MAGNESIUM HARDNESS OF SALT WATER

Magnesium Hardness = Total Hardness - Calcium Hardness

Magnesium Hardness test result may be converted to ppm Magnesium Chloride ($MgCl_2$) by means of the following formula:

ppm $MgCl_2$ = $CaCO_3$ x 0.95

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802 Washington Ave · Chestertown · Maryland · 21620 · USA
800-344-3100 · 410-778-3100 (Outside U.S.A.) · Fax 410-778-6394
www.lamotte.com