

## TITRATION TEST

## CALCIUM, MAGNESIUM &amp; TOTAL HARDNESS (1 mL = 1 mg)

## COMPONENTS:

1 x 5348	Instruction
1 x R-0011P-I	Calcium Indicator Powder, 10 g
1 x R-0618-E	Hardness Reagent .01M, 16 oz
1 x R-0619B-C	Hardness Buffer, 2 oz w/ blue cap, DB
1 x R-0620B-I	Hardness Indicator Powder, 10 g w/ blue dot
1 x R-0653-2-C	Calcium Buffer, 2 oz, DB

## APPARATUS REQUIRED FOR TEST:

Suitable burets, pipets, graduated, and flasks

TO ORDER REPLACEMENT PARTS AND REAGENTS CALL TOLL-FREE  
800-TEST KIT (800-837-8548).

## PROCEDURE:

CAREFULLY READ AND FOLLOW PRECAUTIONS ON REAGENT LABELS.  
KEEP REAGENTS AWAY FROM CHILDREN.

NOTE: When dispensing reagents from dropper bottles, **always** hold bottle in a vertical position.

## Total Hardness Test

1. Select sample size.

NOTE: The sample size will depend on the expected hardness.

Using R-0618 Hardness Reagent .01M (1 mL = 1 mg  $\text{CaCO}_3$ ):

For a 50 mL sample, multiply by 20.

For a 25 mL sample, multiply by 40.

For a 20 mL sample, multiply by 50.

For a 10 mL sample, multiply by 100.

2. Using a pipet, add water to be tested to flask.

3. Add R-0619B Hardness Buffer. Swirl to mix.

NOTE: For every 25 mL of sample, add 0.5 mL R-0619B Hardness Buffer.

For a 50 mL sample, add 1 mL buffer.

For a 25 mL sample, add 0.5 mL buffer.

For a 20 mL sample, add 10 drops buffer.

For a 10 mL sample, add 5 drops buffer.

4. Add 1 level dipper R-0620B Hardness Indicator Powder. Swirl to mix. Sample will turn red if hardness is present.

5. Titrate with R-0618 Hardness Reagent .01M in buret, swirling constantly, until color changes from red to blue. Record buret reading.

6. Multiply buret reading by chosen equivalence. Record as parts per million (ppm) total hardness as calcium carbonate ( $\text{CaCO}_3$ ).

## Calcium Hardness Test

1. Using a pipet add water to be tested to flask.

NOTE: Use same sample size from Step 1 in total hardness test.

2. Add R-0653-2 Calcium Buffer. Swirl to mix.

NOTE: For every 25 mL of sample, add 0.5 mL R-0653-2 Calcium Buffer.

For a 50 mL sample, add 1 mL buffer.

For a 25 mL sample, add 0.5 mL buffer.

For a 20 mL sample, add 10 drops buffer.

For a 10 mL sample, add 5 drops buffer.

3. Add 1 level dipper R-0011P Calcium Indicator Powder. Swirl to mix. Sample will turn red if calcium hardness is present.

4. Titrate with R-0618 Hardness Reagent .01M in buret, swirling constantly, until color changes from red to blue. Record buret reading.

5. Multiply buret reading by chosen equivalence. Record as parts per million (ppm) calcium hardness as calcium carbonate ( $\text{CaCO}_3$ ).

## Magnesium Hardness Test

1. Subtract calcium hardness (CH) from total hardness (TH). Record as parts per million (ppm) magnesium hardness (MH) as calcium carbonate ( $\text{CaCO}_3$ ).

Formula:  $\text{TH} - \text{CH} = \text{MH}$

