

## Methods

### Hardness (calcium)

Reference: West, T. S., DSC, Ph.D., *Complexometry with EDTA and Related Reagents*, 3<sup>rd</sup> ed., pp. 46, 164 (1969).

The EGTA method is specific for calcium hardness. The EGTA titrant in alkaline solution is employed with a zincon indicator. Results are expressed as ppm (mg/L) CaCO<sub>3</sub>.

Shelf-life: eight months. Although the reagent itself is stable, the end point indicator has a limited shelf-life. We recommend stocking quantities that will be used within seven months.

### Hardness (total)

References: APHA Standard Methods, 21<sup>st</sup> ed., Method 2340 C (2005). USEPA Methods for Chemical Analysis of Water and Wastes, Method 130.2 (1983).

The total hardness method is applicable to drinking, surface, boiler, and brine waters.

The EDTA titrant is employed in alkaline solution with a calmagite indicator. This method determines the combined calcium and magnesium concentration of a sample. If no magnesium is present, the end point of the titration normally appears sluggish. Results are expressed as ppm (mg/L) CaCO<sub>3</sub>.



## Visual Kits

Range: 50-500 ppm as CaCO<sub>3</sub>  
MDL: 50 ppm / Method: EGTA

Hardness (calcium) Titrets Kit, Shelf-life 8 months Cat# K-1705

Increments:  
50, 55, 60, 65, 70, 75, 80, 90, 100, 125, 150, 175, 200, 250, 350, 500 ppm

Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules with valve assemblies, Indicator Solution, titrettor, 25 mL sample cup, instructions, and MSDS.

Range: 100-1000 ppm as CaCO<sub>3</sub>  
MDL: 100 ppm / Method: EGTA

Hardness (calcium) Titrets Kit, Shelf-life 8 months Cat# K-1710

Increments:  
100, 110, 120, 130, 140, 150, 160, 180, 200, 250, 300, 350, 400, 500, 700, 1000 ppm

Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules with valve assemblies, Indicator Solution, titrettor, 25 mL sample cup, instructions, and MSDS.

Range: 2-20 ppm as CaCO<sub>3</sub>  
MDL: 2.0 ppm / Method: EDTA

Hardness (total) Titrets Kit Cat# K-4502

Increments:  
2.0, 2.2, 2.4, 2.6, 2.8, 3.0, 3.2, 3.6, 4.0, 5.0, 6.0, 7.0, 8.0, 10, 14, 20 ppm

Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules with valve assemblies, titrettor, 25 mL sample cup, instructions, and MSDS.

Range: 20-200 ppm as CaCO<sub>3</sub>  
MDL: 20 ppm / Method: EDTA

Hardness (total) Titrets Kit Cat# K-4520

Increments:  
20, 22, 24, 26, 28, 30, 32, 36, 40, 50, 60, 70, 80, 100, 140, 200 ppm

Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules with valve assemblies, titrettor, 25 mL sample cup, instructions, and MSDS.

Range: 100-1000 ppm as CaCO<sub>3</sub>  
MDL: 100 ppm / Method: EDTA

Hardness (total) Titrets Kit Cat# K-4585

Increments:  
100, 110, 120, 130, 140, 150, 160, 180, 200, 250, 300, 350, 400, 500, 700, 1000 ppm

Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules with valve assemblies, titrettor, 25 mL sample cup, instructions, and MSDS.

Range: 250-2500 ppm as CaCO<sub>3</sub>  
MDL: 250 ppm / Method: EDTA

Hardness (total) Titrets Kit Cat# K-4530

Increments:  
250, 275, 300, 325, 350, 375, 400, 450, 500, 625, 750, 875, 1000, 1250, 1750, 2500 ppm

Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules with valve assemblies, titrettor, 25 mL sample cup, instructions, and MSDS.

### Kit Components common to Hardness

Description	Cat#
Sample Cup Pack, 25 mL (6 ea)	A-0013
Titrettor Pack (1 ea)	A-0053

Instructions are posted on our website.  
If no shelf-life is listed for a product, then the shelf-life is at least 2 years.