

# Freshwater Monitoring

CHEMetrics is proud to partner with Canada-based Water Rangers to provide reliable water quality test kits for the citizen scientist. Its open data platform makes results available to other scientists and volunteers.

**The Freshwater Education Test Kit (K-0010)** is perfect for educators looking to create a full water testing program or simply a fun student activity. Not only does it provide educational materials to make you a water testing expert, it also gives young people hands-on experience. Lesson plans are available.

**The Freshwater Explorer Test Kit (K-0020)** is ideal for small organizations or individuals. It comes with instructions on how to perform all the tests and how to upload your data, and no prior user experience is required.

**The Freshwater Kit Restocking Pack (R-0010)** refill pack allows you to get back to testing if you've utilized the consumables from either of the two kits mentioned above.



# Glycol

## Method

Ethylene glycol and propylene glycol are the primary ingredients in commercially-available antifreezes. They are used with various corrosion inhibitors to protect metal surfaces in cooling water systems.

CHEMetrics glycol kits are used to monitor potable waters for glycol contamination originating from glycol in cooling systems. They are also used to detect glycol in storm water effluent and airport deicing operations and to monitor glycol recycling operations.

### The Purpald-Periodate Method

**Reference: Purpald® developed by Aldrich Chemical Company. Fritz, James S. and Schenk, George H., Quantitative Analytical Chemistry, 4<sup>th</sup> ed., p. 277 (1979).**

In the colorimetric chemistry, periodic acid oxidizes ethylene glycol and/or propylene glycol to formaldehyde, which reacts with Purpald in alkaline solution. Test results are expressed as ppm (mg/L) ethylene glycol. To convert results to ppm propylene glycol multiply by 2.

This test requires much less time to perform and involves fewer manipulations than the standard chromotropic acid procedure.

Shelf life: 5 months. We recommend stocking quantities that will be used within 4 months.

## Visual Kits

Range: 1-15 & 10-300 ppm as ethylene glycol (EG) (up to 12,000 ppm EG or 24,000 ppm propylene glycol w/sample dilution) MDL: 1 ppm / Method: Purpald-Periodate	
<b>CHEMets Kit</b>	<b>Cat# K-4815</b>
CHEMets Refill, 30 ampoules, Shelf life 5 months	R-4815
Activator Solution Pack, six 20 mL bottles	A-4400 <sup>1</sup>
Activator Solution Pack, six 20 mL bottles	A-4401 <sup>1,2</sup>
Activator Solution Pack, six 10 mL bottles	A-4402 <sup>1</sup>
Comparator	C-4815
1, 2, 3, 4, 5, 6, 8, 10, 15 ppm	
Kit comes in a plastic case and contains everything needed to perform 30 tests (except distilled water): Refill, Comparator, Activator Solutions, 25 mL sample cup, sample cup top, 3 mL syringe and instructions.	

Components and Accessories	
Description	Cat#
Sample Cup Pack, 25 mL (6 ea)	A-0013
Sample Cup Top Pack for 25 mL Cup (6 ea)	A-0014
Syringe Pack 3 mL (6 ea)	A-0063
Pipettor Tips Pack (30 ea)	A-0171

<sup>1</sup>The accessory pack supplies enough solution to perform at least 200 tests.

<sup>2</sup>The Activator Solution, A-4401 is supplied as a dry chemical with NO expiration date. Once reconstituted, the solution has a limited shelf life.

Instructions and SDSs are posted on our website.

If no shelf life is listed for a product, then the shelf life is at least 1 year.

**WARNING!** This product can expose you to chemicals including ethylene glycol, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

# Hardness

## Methods

Hardness is a measure of the mineral content of water. Calcium and magnesium are the most common minerals that contribute to hardness. Hard water causes scaling in boilers and other industrial equipment, and diminishes the effectiveness of soaps and detergents.

### The EGTA Method (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 zircon indicator. Results are expressed as ppm (mg/L) CaCO<sub>3</sub>.

Shelf life: 8 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 7 months.

### The EDTA Method (total)

**References: APHA Standard Methods, 23<sup>rd</sup> ed., Method 2340 C-1997. 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	
<b>Hardness (calcium) Titrets Kit</b> , Shelf life 8 months	<b>Cat# K-1705</b>
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 and instructions.	

Range: 2-20 ppm as CaCO <sub>3</sub> MDL: 2.0 ppm / Method: EDTA	
<b>Hardness (total) Titrets Kit</b>	<b>Cat# K-4502</b>
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 and instructions.	

Range: 20-200 ppm as CaCO <sub>3</sub> MDL: 20 ppm / Method: EDTA	
<b>Hardness (total) Titrets Kit</b>	<b>Cat# K-4520</b>
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 and instructions.	

Range: 100-1000 ppm as CaCO <sub>3</sub> MDL: 100 ppm / Method: EDTA	
<b>Hardness (total) Titrets Kit</b>	<b>Cat# K-4585</b>
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 and instructions.	

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

Instructions and SDSs are posted on our website.

If no shelf life is listed for a product, then the shelf life is at least 1 year.

**WARNING!** These products can expose you to chemicals including ethylene glycol, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).