

The CHEMets system employs vacuum sealed, self-filling ampules for colorimetric analysis. Each ampule contains a premixed, premeasured unit dose of reagent to run one test. Vacuum sealing insures that when the tip is snapped, the correct volume of sample is drawn into the ampule to mix with the reagent. The resulting color change is compared with color standards supplied with each kit. The results are quantitative and are usually ready in two minutes or less. All test methods are based on USEPA, ASTM and APHA standard procedures and chemistries.

Test Procedure:

The CHEMets ampule is immersed in the sample and the tip is snapped off using the specially designed snap cup. The correct volume of sample is drawn in. A small inert gas bubble will form. Mix the sample and reagent by tilting the ampule several times so the bubble travels from end to end. In two minutes or less, the resulting color change is compared to the appropriate color standards to quantify the result. Depending on the test kit, one or two comparators will be provided:

Low Concentrations: Less than 1 ppm. In most cases the cylindrical comparator is used to quantify low concentrations. The test ampule is placed in the center of the comparator and compared with the eight color standards around it.

Medium Concentrations: Above 1 ppm. The flat comparator is usually used for these concentrations. The filled ampule is placed between standards until a color match is found.

Testing Methods:

Ammonia (nitrogen)

ASTM Vol. 11.01 Water (I), p. 380, method D 1426, part, A (1993). APHA Standard Methods, 18th ed., pgs. 4-78, method 4500-NH₃ C (1992).

Test results are determined by direct Nesslerization. Concentration is directly proportional to the intensity of the yellow color formed. A stabilizer solution is added if the test water contains sufficient concentrations of calcium and magnesium to cloud the reagent. The test has a shelf-life of five months. Refrigeration will double the shelf-life of the kits.

Chlorine (free & total) DPD method

EPA Methods for Chemical Analysis of Water and Wastes, method 330.5 (1983).

Free chlorine reacts with DPD to form a red color. The intensity of the pink color is directly proportional to the concentration of chlorine in the sample. When ammonia

or amines are present, some of the chlorine may exist as combined chlorine, which will not interfere with the free chlorine results, provided the reading is taken at one minute. The activator solution provided is used to determine total chlorine.

Iron (total and soluble)

APHA Standard Methods, 18th ed., pgs. 3-66, method 3500-Fe D (1992) ASTM Part 31 on Water, p. 445, method D-1068 part A (1981).

To determine total iron, thioglycolic acid reduces ferric iron to the ferrous state, which then reacts with 1, 10-phenanthroline in acid solution to form a red colored chelate. The intensity of the color is directly proportional to the iron concentration in the sample. The reagents are formulated to compensate for interference from oxidizing agents. To determine soluble iron only, do not use the activator solution.

Nitrate (nitrogen)

ASTM Vol. 11.01 Water (I), p. 583, method D 3867, part B (1993). APHA Standard Methods, 18th ed., pgs. 4-89, method 4500-NO₃-E (1992). EPA Methods for Chemical Analysis of Water and Wastes, method 353.3 (1983).

Nitrate is reduced to nitrite using cadmium as the reducing agent. The nitrite concentration is then determined by the intensity of the resulting pink color. The color of the pink azo dye is directly proportional to the nitrite concentration of the sample. Nitrite will interfere with this test.

Oxygen (dissolved)

Indigo Carmine-ASTM Part 31 on Water, p. 530, method A (1981).

The reduced form of indigo carmine reacts to form a blue color. The intensity of the blue color is directly proportional to the D.O. concentration in the sample. The indigo carmine test is not influenced by temperature, salinity or dissolved gases, which affect D.O. meters.

Phosphate (reactive, ortho)

Stannous chloride-APHA Standard Methods, 18th ed., pgs. 4-114, method 4500-P D (1992).

This test method measures "ortho" or reactive phosphate, which is usually termed "ortho-phosphate". The test uses the molybdenum blue method with stannous chloride reduction. Phosphate reacts with ammonium molybdate and is then reduced by stannous chloride to form a blue complex. The intensity of the color is directly proportional to the phosphate concentration in the sample.

Specifications:

Tests	Range	Comparator Increments	Analysis Time (in minutes)
(Some kits have two ranges)			
Dissolved Oxygen—O ₂	1–12ppm	1, 2, 3, 4, 5, 6, 8, 10, 12 ppm	2
Chlorine (free and total)—Cl ₂	0–1 ppm	0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0 ppm	2
	1–5 ppm	1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0 ppm	
Nitrate (nitrogen)—NO ₃ -N	0–25 ppm	0, 2.5, 5.0, 7.5, 10, 15, 20, 25 ppm	11
	25–125 ppm	25, 27.5, 50, 62.5, 75, 87.5, 100, 112.5, 125 ppm	
Phosphate—PO ₄	0–1 ppm	0, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0 ppm	3
	1–10 ppm	1, 2, 3, 4, 5, 6, 7, 8, 9, 10 ppm	
Iron (total and soluble)—Fe	0–1 ppm	0, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0 ppm	1
	1–10 ppm	1, 2, 3, 4, 5, 6, 7, 8, 9, 10 ppm	
Ammonia (nitrogen)—NH ₃ -N	0–1 ppm	0, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0 ppm	2
	1–10 ppm	1, 2, 3, 4, 5, 6, 7, 8, 9, 10 ppm	

Ordering Information:

225480 Dissolved Oxygen test kit
 225481 Dissolved Oxygen refill
 225482 Chlorine test kit
 225483 Chlorine refill
 225484 Nitrate (nitrogen) test kit
 225485 Nitrate (nitrogen) refill
 52891 Phosphate test kit
 52892 Phosphate refill
 225488 Iron (total and soluble) test kit
 225489 Iron (total and soluble) refill
 16806-1 Ammonia (nitrogen) test kit
 16806-2 Ammonia (nitrogen) refill

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