

Methods

Hydrogen peroxide is a strong oxidizing agent with a variety of uses. Applications include the treating of industrial effluents and domestic waste and serving as a disinfectant in aseptic packaging.

For the food and beverage industry, CHEMetrics Hydrogen Peroxide CHEMets® and Vacu-vials® products are used extensively to monitor sterilization solutions in the packaging and sanitizing processes.

The Ferric Thiocyanate Method

Reference: D. F. Boltz and J. A. Howell, eds., *Colorimetric Determination of Nonmetals*, 2nd ed., Vol. 8, p. 304 (1978).

The ferric thiocyanate method consists of ammonium thiocyanate and ferrous iron in acid solution. Hydrogen peroxide oxidizes ferrous iron to the ferric state, resulting in the formation of a red thiocyanate complex. Chlorine will not interfere with this method. Ferric iron will interfere. Results are expressed as ppm (mg/L) H₂O₂.

The DPD Method

References: USEPA Methods for Chemical Analysis of Water and Wastes, Method 330.5 (1983). APHA Standard Methods, 21st ed., Method 4500-Cl G (2005). D.F. Boltz and J.A. Howell, eds., *Colorimetric Determination of Nonmetals* 2nd ed., Vol. 8, p. 303 (1978).

With the DPD Method, hydrogen peroxide reacts with DPD (N, N-diethyl-p-phenylenediamine) in the presence of potassium iodide and ammonium molybdate to form a pink product. Results are expressed as ppm (mg/L) H₂O₂.

The Ceric Sulfate Titrimetric Method

Reference: Developed by CHEMetrics, Inc.

CHEMetrics developed a titrimetric method using ceric sulfate as the titrant and ferroin as the end point indicator. A color change from green to orange signals the end of the titration. Results are expressed as percent (%) H₂O₂.

The Ceric Sulfate Go-No-Go Method

Reference: Developed by CHEMetrics, Inc.

Developed for clinical applications where hydrogen peroxide in sterilizing/disinfecting solutions with a MEC (minimum effective concentration) of 6.0 ± 1.0% must be monitored for efficacy. A single, small dose of sample is added to a screw cap vial containing ceric sulfate and the endpoint indicator ferroin.

An immediate color change occurs to signal that the hydrogen peroxide level in the sample is either above or below 6.0%.

Visual Kits

Range: 0-0.5 ppm
MDL: 0.025 ppm / Method: DPD

CHEMets Kit	Cat#
CHEMets Refill, 30 ampoules	R-5502
Activator Solution Pack, six 10 mL bottles	A-5500 ¹
Activator Solution Pack, six 10 mL bottles	A-5501 ¹
Comparator 0, 0.05, 0.10, 0.15, 0.20, 0.25, 0.30, 0.50 ppm	C-5502
Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Comparator, Activator Solutions, 25 mL sample cup, instructions, and MSDS.	

Range: 0-1 & 1-10 ppm
MDL: 0.05 ppm / Method: Ferric Thiocyanate

CHEMets Kit	Cat#
CHEMets Refill, 30 ampoules	R-5510
Low Range Comparator 0, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0 ppm	C-5501
High Range Comparator 1, 2, 3, 4, 5, 6, 7, 8, 10 ppm	C-5510
Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Low and High Range Comparators, 25 mL sample cup, instructions, and MSDS.	

¹The accessory pack supplies enough solution to perform at least 200 tests.



Range: 0-30 & 30-300 ppm MDL: 5 ppm / Method: Ferric Thiocyanate	
VACUettes Kit	Cat# K-5510D
VACUettes Refill, 30 ampoules	R-5510D
Low Range Comparator 0, 5, 7.5, 10, 15, 20, 25, 30 ppm	C-5501D
High Range Comparator 30, 60, 90, 120, 150, 175, 200, 250, 300 ppm	C-5510D
Kit comes in a plastic case and contains everything needed to perform 30 tests (except distilled water): Refill, Low and High Range Comparators, dilutor snapper cup, micro test tube, instructions, and MSDS.	

Range: 0-1200 & 1200-12,000 ppm MDL: 200 ppm / Method: Ferric Thiocyanate	
VACUettes Kit	Cat# K-5510C
VACUettes Refill, 30 ampoules	R-5510C
Low Range Comparator 0, 200, 300, 400, 600, 800, 1000, 1200 ppm	C-5501C
High Range Comparator 1200, 2400, 3600, 4800, 6000, 7000, 8000, 10,000, 12,000 ppm	C-5510C
Kit comes in a plastic case and contains everything needed to perform 30 tests (except distilled water): Refill, Low and High Range Comparators, dilutor snapper cup, micro test tube, instructions, and MSDS.	

Range: 0-60 & 60-600 ppm MDL: 10 ppm / Method: Ferric Thiocyanate	
VACUettes Kit	Cat# K-5510A
VACUettes Refill, 30 ampoules	R-5510A
Low Range Comparator 0, 10, 15, 20, 30, 40, 50, 60 ppm	C-5501A
High Range Comparator 60, 120, 180, 240, 300, 350, 400, 500, 600 ppm	C-5510A
Kit comes in a plastic case and contains everything needed to perform 30 tests (except distilled water): Refill, Low and High Range Comparators, dilutor snapper cup, micro test tube, instructions, and MSDS.	

Range: 2-20% MDL: 2.0% Method: Ceric Sulfate Titrant with Ferroin Indicator	
Titrets Kit	Cat# K-5530
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%	
Kit comes in a cardboard box and contains everything needed to perform 30 tests (except distilled water): thirty ampoules with valve assemblies, 1.0 mL syringe, titrettor, 50 mL sample cup, instructions, and MSDS.	

Go-No-Go Kit

Range: 0-120 & 120-1200 ppm MDL: 20 ppm / Method: Ferric Thiocyanate	
VACUettes Kit	Cat# K-5510B
VACUettes Refill, 30 ampoules	R-5510B
Low Range Comparator 0, 20, 30, 40, 60, 80, 100, 120 ppm	C-5501B
High Range Comparator 120, 240, 360, 480, 600, 700, 800, 1000, 1200 ppm	C-5510B
Kit comes in a plastic case and contains everything needed to perform 30 tests (except distilled water): Refill, Low and High Range Comparators, dilutor snapper cup, micro test tube, instructions, and MSDS.	

Range: 6.0% Control Point Method: Ceric Sulfate Titrant with Ferroin Indicator	
Go-No-Go Kit	Cat# K-5500C
Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty 16-mm vials with caps, thirty pipette tips, 100 uL MiniPet [®] , Indicator Solution, instructions, and MSDS.	

MiniPet[®] is a registered trademark of Tricontinent Scientific, Inc.



 Instrumental Kits

V-2000 Multi-Analyte Photometer

(See page 14 for instrumental features)

Range: 0.15-3.00 ppm
Method: DPD

Vacu-vials Kit	Cat# K-5513
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Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, Activator Solutions, 25 mL sample cup, ampoule blank, instructions, and MSDS.

Range: V-2000: 0.15-6.00 ppm /Spec: 0.15-4.00 ppm
Method: Ferric Thiocyanate

Vacu-vials Kit	Cat# K-5543
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Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, 25 mL sample cup, ampoule blank, instructions, and MSDS.

Vacu-vials Kits require the use of the V-2000 Photometer or a spectrophotometer capable of accepting a 13 mm diameter round cell. Instrument sold separately.

SAM Single-Analyte Photometer

(See page 17 for instrumental features)

Range: 0.15-6.00 ppm
Method: Ferric Thiocyanate

Hydrogen Peroxide SAM Kit	Cat# I-2016
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Vacu-vials Kit, 30 ampoules, 25 mL sample cup, ampoule blank, instructions, and MSDS.

SAM Kit comes in a plastic case and contains everything needed to perform 30 tests: Vacu-vials Kit, SAM Photometer, light shield, 4 AAA batteries, screwdriver, and instructions.

Kit Components common to Hydrogen Peroxide

Description	Cat#
Sample Cup Pack, 25 mL (6 ea)	A-0013
Micro Test Tube Pack (10 ea)	A-0015
Dilutor Snapper Cup Pack (6 ea)	A-0018
Ampoule Blank Pack (5 ea)	A-0023
Syringe Pack, 1.0 mL (6 ea)	A-0027
Titrettor Pack (1 ea)	A-0053
Sample Cup & Cap Pack, 50 mL (6 ea)	A-0058
MiniPet [®] , 100 µL (1 ea)	A-0170
Pipette Tips Pack, (30 ea)	A-0171

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

