# **Hydrazine**

#### Method

Hydrazine is a powerful reducing agent that is used in various chemical processes and in boiler water as an oxygen scavenger. To control corrosion, residual hydrazine typically is maintained in the 0.05 to 0.1 mg/L range. Higher levels may be used to guard against corrosion when the boiler is out of service for an extended period.

#### The PDMAB Method

References: ASTM D 1385-07, Hydrazine in Water. L. C. Thomas and G. J. Chamberlin, Colorimetric Chemical Analytical Methods, 8<sup>th</sup> ed., pp. 194-195, Method I (1974).

CHEMetrics' hydrazine test kits employ the PDMAB, paradimethylaminobenzaldehyde chemistry. PDMAB in acid solution reacts with hydrazine to form a yellow product. Results are expressed as ppb ( $\mu$ g/L) or ppm ( $\mu$ g/L)  $\nu$ g/L.



and instructions.

Range: 0-0.5 ppm MDL: 0.005 ppm / Method: PDMAB	
	Cat#
CHEMets Kit	K-5005
CHEMets Refill, 30 ampoules	R-5005
Comparator 0, 0.01, 0.03, 0.05, 0.07, 0.1, 0.3, 0.5 ppm	C-5005
Kit comes in a plastic case and contains everything needed to Refill, Comparator, 25 mL sample cup and instructions.	perform 30 tests:

Range: 0-12.5 ppm MDL: 0.25 ppm / Method: PDMAB	
	Cat#
VACUettes Kit	K-5005D
VACUettes Refill, 30 ampoules	R-5005D
Comparator 0, 0.25, 0.75, 1.25, 1.75, 2.5, 7.5, 12.5 ppm	C-5005D
Kit comes in a plastic case and contains everything needed to perfor	m 30 tests

(except distilled water): Refill, Comparator, dilutor snapper cup, micro test tube

# Range: 0-25 ppm MDL: 0.5 ppm / Method: PDMAB Cat# VACUettes Kit VACUettes Refill, 30 ampoules Comparator 0, 0.5, 1.5, 2.5, 3.5, 5, 15, 25 ppm C-5005A Kit comes in a plastic case and contains everything needed to perform 30 tests (except distilled water): Refill, Comparator, dilutor snapper cup, micro test tube and instructions.

Range: 0-50 ppm MDL: 1 ppm / Method: PDMAB	
VACUettes Kit	Cat# K-5005B
VACUettes Refill, 30 ampoules	R-5005B
Comparator 0, 1, 3, 5, 7, 10, 30, 50 ppm	C-5005B
Kit comes in a plastic case and contains everything needed to perform 30 tests (except distilled water): Refill, Comparator, dilutor snapper cup, micro test tube and instructions.	

Range: 0-500 ppm MDL: 10 ppm / Method: PDMAB	
VACUettes Kit	Cat# K-5005C
VACUettes Refill, 30 ampoules	R-5005C
Comparator 0, 10, 30, 50, 70, 100, 300, 500 ppm	C-5005C
Kit comes in a plastic case and contains everything needs (except distilled water): Refill, Comparator, dilutor snapp and instructions.	

Components and Accessories	
Description	Cat#
Sample Cup Pack, 25 mL (6 ea) Micro Test Tube Pack (10 ea) Dilutor Snapper Cup Pack (6 ea)	A-0013 A-0015 A-0018

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.

# **Hydrogen Peroxide**

#### **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, 2<sup>nd.</sup> 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, peracetic acid, and cupric copper will interfere.\* Results are expressed as ppm (mg/L) H<sub>2</sub>O<sub>2</sub>.

#### **The DPD Method**

References: APHA Standard Methods Online, Method 4500-H<sub>2</sub>O<sub>2</sub> B-2020.

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)  $H_2O_2$ .

#### **The Ceric Sulfate Titrimetric Method**

Reference: Developed by CHEMetrics.

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 (%) H<sub>2</sub>O<sub>2</sub>. The test range can be modified by performing a sample dilution. **Details are provided in the kit instructions for ranges of 0.01 - 0.1% through 2-20%.** 



Range: 0-0.5 ppm MDL: 0.025 ppm / Method: DPD	
CHEMets Kit	Cat# K-5502
CHEMets Refill, 30 ampoules	R-5502
Activator Solution Pack, six 10 mL bottles	A-5500 <sup>1</sup>
Activator Solution Pack, six 10 mL bottles	A-55011
Comparator 0, 0.05, 0.10, 0.15, 0.20, 0.30, 0.40, 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 and instructions.	

Range: 0-0.8 & 1-10 ppm MDL: 0.05 ppm /Method: Ferric Thiocyanate	
CHEMets Kit	Cat# K-5510
CHEMets Refill, 30 ampoules	R-5510
Low Range Comparator 0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8 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 and instructions.	

- <sup>1</sup> The accessory pack supplies enough solution to perform at least 200 tests.
- \* Contact technical@chemetrics.com for more information.



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MARNING! These products can expose you to chemicals including methanol, 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.

MARNING! The product employing the Ferric Thiocyanate method can expose you to chemicals including methanol, which is known to the State of California to cause birth defects or other reproductive harm. For more information, go to www.P65Warnings.gov.

#### Range: 0-25 & 30-300 ppm MDL: 5 ppm / Method: Ferric Thiocyanate

	Cat#
VACUettes Kit	K-5510D
VACUettes Refill, 30 ampoules	R-5510D
Low Range Comparator 0, 5, 7.5, 10, 12.5, 15, 20, 25 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 and instructions.

#### Range: 0-50 & 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, 25, 35, 40, 50 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 and instructions.

#### Range: 0-100 & 120-1200 ppm MDL: 20 ppm / Method: Ferric Thiocyanate

	Cat#
VACUettes Kit	K-5510B
VACUettes Refill, 30 ampoules	R-5510B
Low Range Comparator 0, 20, 30, 40, 55, 70, 85, 100 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 and instructions.

#### Range: 0-1000 & 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, 550, 700, 850, 1000 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 and instructions.

## Range: 0.1-1.0% (up to 20% with dilution)

	Cat#
Titrets Kit	K-5530

Increments: 0.10, 0.11, 0.12, 0.13, 0.14, 0.15, 0.16, 0.18, 0.20, 0.25, 0.30, 0.35, 0.40, 0.50, 0.70, 1.0%

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, 3.0 mL syringe, titrettor, 25 mL sample cup and instructions.



WARNING! The product employing the Ferric Thiocyanate method can expose you to chemicals including methanol, 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.

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## **Multi-Analyte Photometers**

V-2000 / V-3000

Vacu-vials Kit

(See page 14 for instrumental features)

Range: 0-6.00 ppm Method: Ferric Thiocyanate

> Cat# K-5543

Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, 25 mL sample cup, ampoule blank and instructions.

Vacu-vials Kits require the use of a CHEMetrics Direct-Readout Photometer (photometers sold separately) or a spectrophotometer capable of accepting a 13 mm diameter round cell. See page 14 for details.

WARNING! The product employing the Ferric Thiocyanate method can expose you to chemicals including methanol, 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.

### **SAM Single Analyte Photometer**

(See page 16 for instrumental features)

Range: 0-6.00 ppm Method: Ferric Thiocyanate

Hydrogen Peroxide SAM Kit I-2016

Vacu-vials Kit, 30 ampoules, 25 mL sample cup, ampoule blank and instructions. K-5543

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.

Components and Accessories	
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
Syringe Pack, 3.0 mL (6 ea)	A-0063
* Sample Zeroing Accessory Pack	A-0503
Hydrogen Peroxide Standard (for 0.5 ppm standard)	A-5505

\* For use when testing colored or turbid samples. See page 13 for details.

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.

