

Methods

Low-level ammonia nitrogen may be naturally present in water as a result of the biological decay of plant and animal matter. Higher concentrations in surface waters can indicate contamination from waste treatment facilities, raw sewage, industrial effluents (particularly from petroleum refineries), or fertilizer runoff. Excessive ammonia concentrations are toxic to aquatic life.

The Direct Nesslerization Method

Reference: ASTM D 1426-98, Ammonia Nitrogen in Water, Test Method A. APHA Standard Methods, 18th ed., pp. 4-78, Method 4500-NH₃ C (1992).

The test kits employing the well-established Nessler reagent to determine ammonia concentrations are applicable to drinking water, clean surface water, good-quality nitrified wastewater effluent, and seawater. In some waters, calcium and magnesium concentrations can cause cloudiness of the reagent. Adding a few drops of stabilizer solution (Rochelle Salt) will prevent this cloudiness. References recommend distilling samples prior to analysis. Results are expressed as ppm (mg/L) ammonia-nitrogen, NH₃-N.

Shelf-life: although the Nessler reagent is stable, its high alkali content attacks the glass ampoule. The resulting precipitate interferes with color comparison. We recommend stocking quantities of CHEMets® and VACUettes® ampoules that will be used within five months. A two-month supply of Vacu-vials ampoules is suggested. **Refrigeration will dramatically extend the shelf-life of these products.**

The Salicylate Method

References: Krom, Michael D., Spectrophotometric Determination of Ammonia: A Study of a Modified Berthelot Reduction Using Salicylate and Dichloroisocyanurate, *The Analyst*, V105, pp. 305-316, 1980.

In the ammonia test method that employs the Salicylate chemistry, free ammonia reacts with hypochlorite to form monochloramine. Monochloramine reacts with salicylate, in the presence of sodium nitro-ferricyanide, to form 5-aminosalicylate, a green-colored complex. This test method measures free ammonia and monochloramine. Results are expressed in ppm (mg/L) ammonia-nitrogen, NH₃-N.

The Salicylate Method offers the same sensitivity as the Nessler Method, and it is available in both visual and instrumental versions. The benefits that the Salicylate product line offers are that the shelf-life of the ampoules is unlimited and there is no hazardous waste generation.

Visual Kits

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

	Cat#
CHEMets Kit	K-1410
CHEMets Refill, 30 ampoules	R-1401
Activator Solution Pack, six 20 mL bottles, Shelf-life 1 year	A-1400 ¹
Catalyzer Solution Pack, six 20 mL bottles, Shelf-life 2 years	A-1401 ¹
Comparator, Shelf-life 2 years: 0, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0 ppm	C-1401

Kit comes in a plastic case and contains everything needed to perform 30 tests (except distilled water): Refill, Comparator, Activator Solution, Catalyzer Solution, 25 mL sample cup, 3.0 mL syringe, instructions, and MSDS.

Range: 0-1 & 1-10 ppm
MDL: 0.05 ppm / Method: Direct Nesslerization

	Cat#
CHEMets Kit	K-1510
CHEMets Refill, 30 ampoules, Shelf-life 5 months	R-1501 ²
Stabilizer Solution Pack, six 10 mL bottles, Shelf-life 2 years	A-1500 ¹
Stabilizer Solution Pack, six 60 mL bottles, Shelf-life 2 years	A-1501 ¹
Low Range Comparator, Shelf-life 2 years: 0, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0 ppm	C-1501
High Range Comparator, Shelf-life 2 years: 1, 2, 3, 4, 5, 6, 7, 8, 10 ppm	C-1510

Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Low and High Range Comparators, Stabilizer Solutions, 25 mL sample cup, 1.0 mL syringe, instructions, and MSDS.

Range: 0-25 & 25-250 ppm
MDL: 2.5 ppm / Method: Direct Nesslerization

	Cat#
VACUettes Kit	K-1510D
VACUettes Refill, 30 ampoules, Shelf-life 5 months	R-1501D ²
Low Range Comparator, Shelf-life 2 years: 0, 2.5, 5, 7.5, 10, 15, 20, 25 ppm	C-1501D
High Range Comparator, Shelf-life 2 years: 25, 50, 75, 100, 125, 150, 175, 200, 250 ppm	C-1510D

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.



Instrumental Kits

Range: 0-50 & 50-500 ppm MDL: 5 ppm / Method: Direct Nesslerization	
VACUettes Kit	Cat# K-1510A
VACUettes Refill, 30 ampoules, Shelf-life 5 months	R-1501A ²
Low Range Comparator, Shelf-life 2 years: 0, 5, 10, 15, 20, 30, 40, 50 ppm	C-1501A
High Range Comparator, Shelf-life 2 years: 50, 100, 150, 200, 250, 300, 350, 400, 500 ppm	C-1510A
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: 0-100 & 100-1000 ppm MDL: 10 ppm / Method: Direct Nesslerization	
VACUettes Kit	Cat# K-1510B
VACUettes Refill, 30 ampoules, Shelf-life 5 months	R-1501B ²
Low Range Comparator, Shelf-life 2 years: 0, 10, 20, 30, 40, 60, 80, 100 ppm	C-1501B
High Range Comparator, Shelf-life 2 years: 100, 200, 300, 400, 500, 600, 700, 800, 1000 ppm	C-1510B
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: 0-1000 & 1000-10,000 ppm MDL: 100 ppm / Method: Direct Nesslerization	
VACUettes Kit	Cat# K-1510C
VACUettes Refill, 30 ampoules, Shelf-life 5 months	R-1501C ²
Low Range Comparator, Shelf-life 2 years: 0, 100, 200, 300, 400, 600, 800, 1000 ppm	C-1501C
High Range Comparator, Shelf-life 2 years: 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 10,000 ppm	C-1510C
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.	

¹The accessory pack supplies enough solution to perform at least 200 tests. A-1501 accessory pack supplies enough solution to analyze at least 200 seawater samples.

²This shelf-life can be extended by 18 months if the ampoules are stored in the refrigerator when not in use.

If no shelf-life is listed for a product, then the shelf-life is at least 2 years.

V-2000 Multi-Analyte Photometer (See page 8 for instrumental features)

Range: 0.10-3.00 ppm
Method: Salicylate

Range: 0.10-3.00 ppm Method: Salicylate	
Vacu-vials Kit , Shelf-life 1 year	Cat# K-1403
Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, Activator Solution, Catalyzer Solution, 25 mL sample cup, ampoule blank, instructions, calibration table, and MSDS.	

Range: 0.50-7.00 ppm
Method: Direct Nesslerization

Range: 0.50-7.00 ppm Method: Direct Nesslerization	
Vacu-vials Kit , Shelf-life 2 months	Cat# K-1503²
Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, Stabilizer Solutions, 25 mL sample cup, ampoule blank, 1.0 mL syringe, instructions, calibration table, and MSDS.	

Range: 1.0-14.0 ppm
Method: Direct Nesslerization

Range: 1.0-14.0 ppm Method: Direct Nesslerization	
Vacu-vials Kit , Shelf-life 2 months	Cat# K-1523²
Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, Stabilizer Solutions, 25 mL sample cup, ampoule blank, 1.0 mL syringe, instructions, calibration table, 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.

V-1000 Multi-Analyte Photometer (See page 10 for instrumental features)

Range: 0.30-3.00 ppm
Method: Salicylate

Range: 0.30-3.00 ppm Method: Salicylate	
VVR Module	Cat# V-1403
Vacu-vials Refill, 30 ampoules	R-1403
Activator Solution Pack, six 20 mL bottles, Shelf-life 1 year	A-1400 ¹
Catalyzer Solution Pack, six 20 mL bottles, Shelf-life 2 years	A-1401 ¹
VVR Filter, Shelf-life 2 years	F-1403
Module comes in a cardboard box and contains everything needed to perform 30 tests: Refill, VVR Filter, Activator Solution, Catalyzer Solution, 25 mL sample cup, instructions, and MSDS.	

VVR Modules require the use of the V-1000 Photometer. Instrument sold separately.

Range: 0.70-7.00 ppm Method: Direct Nesslerization	
VVR Module	Cat# V-1503
Vacu-vials Refill, 30 ampoules, Shelf-life 2 months	R-1503 ²
Stabilizer Solution Pack, six 10 mL bottles, Shelf-life 2 years	A-1500 ¹
Stabilizer Solution Pack, six 60 mL bottles, Shelf-life 2 years	A-1501 ¹
VVR Filter, Shelf-life 2 years	F-1503
Module comes in a cardboard box and contains everything needed to perform 30 tests: Refill, VVR Filter, Stabilizer Solutions, 25 mL sample cup, 1.0 mL syringe, instructions, and MSDS.	

Range: 1.4-14.0 ppm Method: Direct Nesslerization	
VVR Module	Cat# V-1523
Vacu-vials Refill, 30 ampoules, Shelf-life 2 months	R-1523 ²
Stabilizer Solution Pack, six 10 mL bottles, Shelf-life 2 years	A-1500 ¹
Stabilizer Solution Pack, six 60 mL bottles, Shelf-life 2 years	A-1501 ¹
VVR Filter, Shelf-life 2 years	F-1523
Module comes in a cardboard box and contains everything needed to perform 30 tests: Refill, VVR Filter, Stabilizer Solutions, 25 mL sample cup, 1.0 mL syringe, instructions, and MSDS.	

VVR Modules require the use of the V-1000 Photometer. Instrument sold separately.

SAM Single-Analyte Photometer (See page 10 for instrumental features)

Range: 0.50-7.00 ppm Method: Direct Nesslerization	
SAM Kit	Cat# I-2004
Vacu-vials Refill, 30 ampoules, Shelf-life 2 months	R-1503 ²
Stabilizer Solution Pack, six 10 mL bottles, Shelf-life 2 years	A-1500 ¹
Stabilizer Solution Pack, six 60 mL bottles, Shelf-life 2 years	A-1501 ¹
Kit comes in a plastic case and contains everything needed to perform 30 tests: SAM Photometer, Refill, Stabilizer Solutions, 25 mL sample cup, 9V battery, 1.0 mL syringe, ampoule blank, test tube, light shield, instructions, and MSDS.	

¹The accessory pack supplies enough solution to perform at least 200 tests. A-1501 accessory pack supplies enough solution to analyze at least 200 seawater samples.

²This shelf-life can be extended by 18 months if the ampoules are stored in the refrigerator when not in use.

Kit Components common to Ammonia	
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
Test Tube Pack (10 ea)	A-0025
Syringe Pack, 1.0 mL (6 ea)	A-0027
Syringe Pack, 3.0 mL (6 ea)	A-0063
VVR Zero Ampoule Pack (5 ea)	A-0128
VVR Zero Test Tube Pack (5 ea)	A-0129
SAM Light Shield (1 ea)	A-0138

