Nitrite

DOC316.53.01073

Diazotization Method

Method 10019

0.003 to 0.500 mg/L NO_2^-–N (LR)

Test 'N Tube™ Vials

Scope and application: For water, wastewater and seawater.

Test preparation

Instrument-specific information

Table 1 shows all of the instruments that have the program for this test. The table also shows the adapter and light shield requirements for the applicable instruments that can use Test 'N Tube vials.

To use the table, select an instrument, then read across to find the applicable information for this test.

Table 1 Instrument-specific information for Test 'N Tube vials

Instrument	Adapters	Light shield
DR6000, DR5000	—	—
DR3900	—	LZV849
DR3800, DR2800, DR2700	—	LZV646
DR1900	9609900 (D[1])	—
DR900	4846400	Cover supplied with the instrument

Before starting

Install the instrument cap on the DR900 cell holder before ZERO or READ is pushed.
DR3900, DR3800, DR2800 and DR2700: Install the light shield in Cell Compartment #2 before this test is started.
For the best results, measure the reagent blank value for each new lot of reagent. Replace the sample with deionized water in the test procedure to determine the reagent blank value. Subtract the reagent blank value from the sample results automatically with the reagent blank adjust option.
UV light changes the color of the prepared sample to yellow. Keep the prepared sample out of direct sunlight.
Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.
Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

Items to collect

Description	Quantity
Light shield (For information about sample cells, adapters or light shields, refer to Instrument-specific information on page 1.)	1
Test 'N Tube™ NitriVer® 3 Nitrite Reagent Set	1
Pipet, TenSette® 1.0 to 10.0 mL with tips	varies

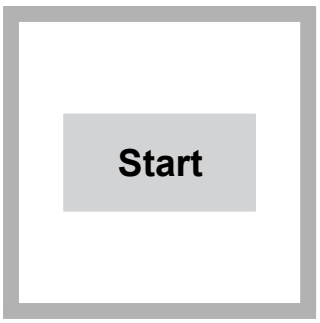
Refer to Consumables and replacement items on page 4 for order information.

[1] The D adapter is not available with all instrument versions.

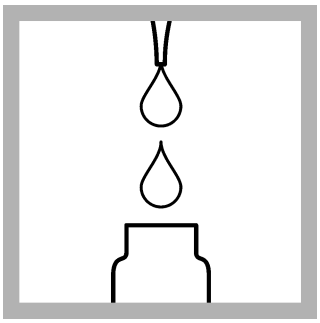
Sample collection and storage

- Collect samples in clean glass or plastic bottles.
- To preserve samples for later analysis, keep the samples at or below 6 °C (43 °F) for up to 48 hours.
- Let the sample temperature increase to room temperature before analysis.

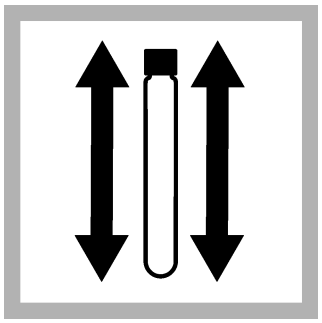
Test 'N Tube procedure



1. Start program **345 N, Nitrite LR TNT**. For information about sample cells, adapters or light shields, refer to Instrument-specific information on page 1.

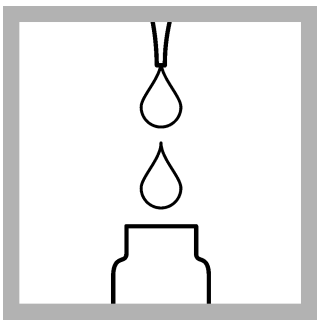


2. Prepare the sample: Fill a Test 'N Tube NitriVer 3 Nitrite vial with 5 mL of sample.

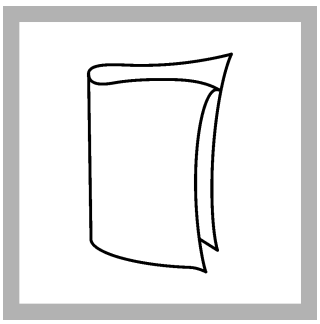


3. Put the cap on the vial. Shake to dissolve the powder. A pink color shows if nitrite-nitrogen is present in the sample .

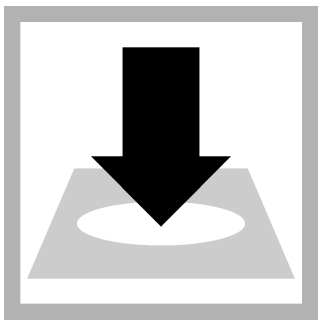
4. Start the instrument timer. A 20-minute reaction time starts.



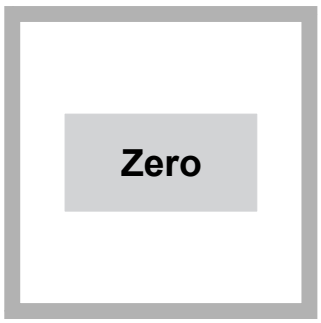
5. Prepare the blank: When the timer expires, fill an empty Test 'N Tube vial with 5 mL of sample.



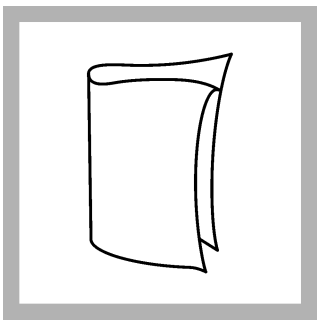
6. Clean the blank vial.



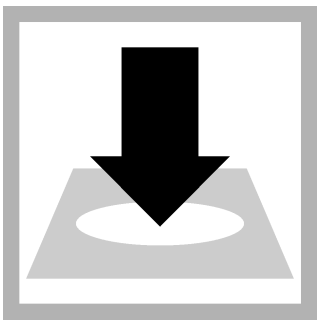
7. Insert the blank vial into the 16-mm cell holder.



8. Push **ZERO**. The display shows 0.000 mg/L NO_2^-–N.



9. Clean the sample vial.



10. Insert the sample vial into the 16-mm cell holder.

11. Push **READ**. Results show in mg/L NO_2^-–N.

Interferences

Interfering substance	Interference level
Antimonous ions	Interfere by causing precipitation
Auric ions	Interfere by causing precipitation
Bismuth ions	Interfere by causing precipitation
Chloroplatinate ions	Interfere by causing precipitation
Cupric ions	Cause low results
Ferric ions	Interfere by causing precipitation
Ferrous ions	Cause low results
Lead ions	Interfere by causing precipitation
Mercurous ions	Interfere by causing precipitation
Metavanadate ions	Interfere by causing precipitation
Nitrate	Very high levels of nitrate (>100 mg/L nitrate as N) appear to undergo a slight amount of reduction to nitrite, either spontaneously or during the course of the test. A small amount of nitrite will be found at these levels.
Silver ions	Interfere by causing precipitation
Strong oxidizing and reducing substances	Interfere at all levels
Interference from direct sunlight	UV light changes the color of the prepared sample to yellow. Keep the prepared sample out of direct sunlight.

Accuracy check

Standard solution method

Use the standard solution method to validate the test procedure, the reagents and the instrument.

Items to collect:

- Nitrite Standard Solution, 250 mg/L (as N)
- 250-mL volumetric flask, Class A
- 100-mL volumetric flask, Class A
- Pipet, TenSette, 1.0–10.0 mL
- Pipet tips for TenSette Pipet, 1.0–10.0 mL
- Deionized water

1. Prepare a 3.00 mg/L nitrite (as N) stock solution as follows:
   a. Use a pipet to add 3.00 mL of a 250 mg/L nitrite (as N) standard solution into a 250-mL volumetric flask.
   b. Dilute to the mark with deionized water. Mix well. Prepare the stock solution each day.
2. Prepare a 0.300 mg/L nitrite (as N) standard solution as follows:
   a. Use a pipet to add 10.00 mL of the 3.00 mg/L nitrite (as N) stock solution into a 100-mL volumetric flask.
   b. Dilute to the mark with deionized water. Mix well. Prepare the standard solution each day.
3. Use the test procedure to measure the concentration of the prepared standard solution.

4. Compare the expected result to the actual result.

   Note: *The factory calibration can be adjusted slightly with the standard adjust option so that the instrument shows the expected value of the standard solution. The adjusted calibration is then used for all test results. This adjustment can increase the test accuracy when there are small variations in the reagents or instruments.*

Method performance

The method performance data that follows was derived from laboratory tests that were measured on a spectrophotometer during ideal test conditions. Users can get different results under different test conditions.

Program	Standard	Precision (95% confidence interval)	Sensitivity Concentration change per 0.010 Abs change
345	0.300 mg/L NO_2^-–N	0.294–0.306 mg/L NO_2^-–N	0.003 mg/L NO_2^-–N

Summary of method

Nitrite in the sample reacts with sulfanilic acid to form an intermediate diazonium salt. This couples with chromotropic acid to produce a pink colored complex directly proportional to the amount of nitrite present. The measurement wavelength is 507 nm for spectrophotometers or 520 nm for colorimeters.

Consumables and replacement items

Required reagents

Description	Quantity/test	Unit	Item no.
NitriVer® 3 Nitrite Reagent Set, Test 'N Tube™	1	50/pkg	2608345

Required apparatus

Description	Quantity/test	Unit	Item no.
Pipet, TenSette®, 1.0–10.0 mL	1	each	1970010
Pipet tips, for TenSette® Pipet, 1.0–10.0 mL	varies	50/pkg	2199796

Recommended standards, reagents and apparatus

Description	Unit	Item no.
Nitrite Standard Solution, 250 mg/L (as N)	500 mL	2340249
Pipet tips for TenSette® Pipet, 1.0–10.0 mL	250/pkg	2199725
Water, deionized	4 L	27256

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