Nitrite

DOC316.53.01074

USEPA Diazotization Method[1] — Method 8507

0.002 to 0.300 mg/L NO_2^-–N (LR, spectrophotometers) — Powder Pillows

0.005 to 0.350 mg/L NO_2^-–N (LR, colorimeters)

Scope and application: For water, wastewater and seawater.

[1] USEPA approved for wastewater analysis, Federal Register, 44(85), 25505 (May 1, 1979).

Test preparation

Instrument-specific information

Table 1 shows all of the instruments that have the program for this test. The table also shows sample cell and orientation requirements for reagent addition tests, such as powder pillow or bulk reagent tests.

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

Table 1 Instrument-specific information

Instrument	Sample cell orientation	Sample cell
DR6000 DR3800 DR2800 DR2700 DR1900	The fill line is to the right.	2495402 
DR5000 DR3900	The fill line is toward the user.	
DR900	The orientation mark is toward the user.	2401906 

Before starting

Install the instrument cap on the DR900 cell holder before ZERO or READ is pushed.
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.

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Items to collect

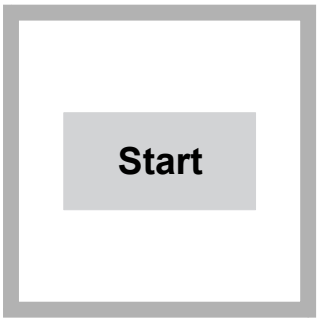
Description	Quantity
NitriVer® 3 Reagent Powder Pillows, 10 mL	1
Sample cells. (For information about sample cells, adapters or light shields, refer to Instrument-specific information on page 1.)	2

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

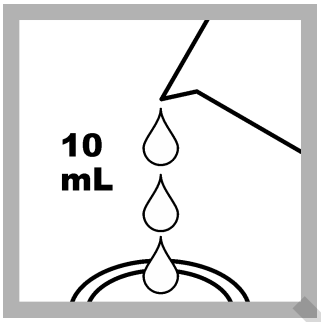
Sample collection and storage

- 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.

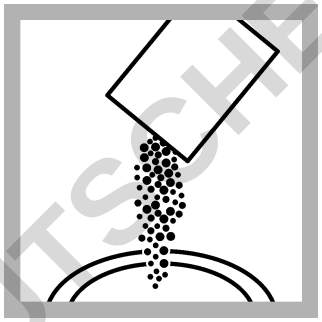
Test procedure



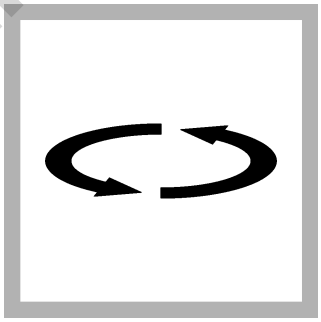
1. Start program **371 N, Nitrite LR PP**. For information about sample cells, adapters or light shields, refer to Instrument-specific information on page 1.



2. Prepare the sample: Fill a sample cell with 10 mL of sample.



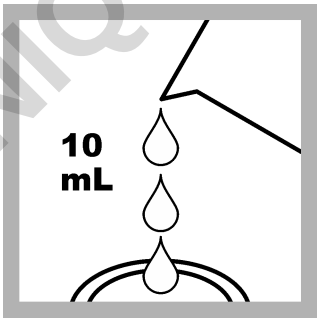
3. Add the contents of one NitriVer 3 Reagent Powder Pillow.



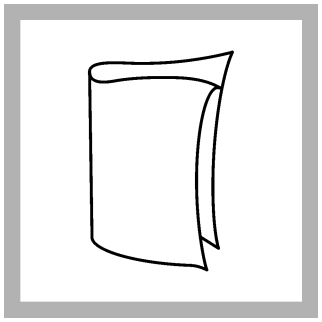
4. Swirl to mix.
A pink color shows if nitrite is present in the sample.



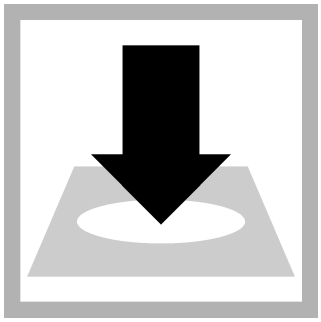
5. Start the instrument timer. A 20-minute reaction time starts.



6. Prepare the blank: When the timer expires, fill a second sample cell with 10 mL of sample.

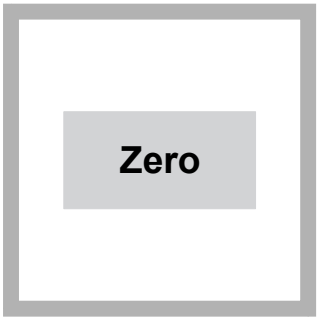


7. Clean the blank sample cell.

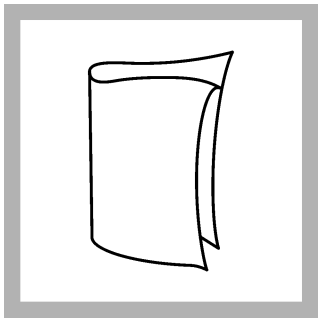


8. Insert the blank into the cell holder.

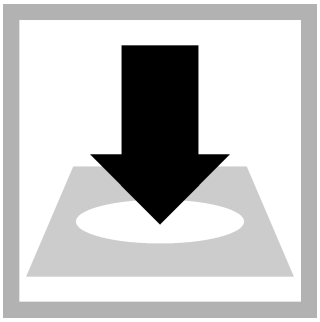
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9. Push **ZERO**. The display shows 0.000 mg/L NO_2^-–N.



10. Clean the prepared sample cell.



11. Insert the prepared sample into the cell holder.



12. 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:

- 0.150 mg/L NO_2^-–N standard solution (Nitrite standard solutions are difficult to prepare. Use the instructions in Standard Methods for the Examination of Water and Wastewater, Method 4500—NO_2-B)

1. Use the test procedure to measure the concentration of the standard solution.
2. Compare the expected result to the actual result.

   Note: *The factory calibration can be adjusted slightly with the standard calibration 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.*

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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
371	0.150 mg/L NO_2^-–N	0.147–0.153 mg/L NO_2^-–N	0.002 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 Powder Pillow, 10 mL	1	100/pkg	2107169

Recommended standards, reagents and apparatus

Description	Unit	Item no.
Balance, analytical, 80 g x 0.1 mg 100–240 VAC	each	2936701
Standard Methods for the Examination of Water and Wastewater (current edition)	each	2270800
Sodium Nitrite, ACS	454 g	245201
Water, deionized	4 L	27256

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