ezSample Snap Vial - Nitrate (EZ-2333B)

Introduction

The ezSample Snap Vial is designed to be used with the Wireless Colorimeter and Turbidity Sensor (PS-3215) or the PASPORT Water Quality Colorimeter (PS-2179) and PASCO data collection software. The vials contain a vacuum sealed color-forming reagent to test for the presence of nitrate in water samples.

Equipment

Included equipment:

- Nitrate test vials (30)
- Calibration ampoule
- Zinc Foil Pack A-6905 (30)
- A-6901 Acidifier Solution
- Reaction tube
- Sample cup

Required equipment:

- Wireless Colorimeter and Turbidity Sensor (PS-3215) *or* PASPORT Water Quality Colorimeter (PS-2179)
- SPARKvue or PASCO Capstone data collection software

Test procedures

CAUTION: Carefully read the Safety Data Sheet (SDS) before performing the test procedures. Always wear safety glasses and disposable gloves during testing.

Nitrate-nitrogen

1. Fill the reaction tube (screw cap tube) to the 15 mL mark with the sample to be tested.
2. Empty the contents of one Zinc Foil Pack A-6905 into the reaction tube, as shown in Figure 1. Cap the reaction tube and shake it vigorously for exactly 3 minutes.

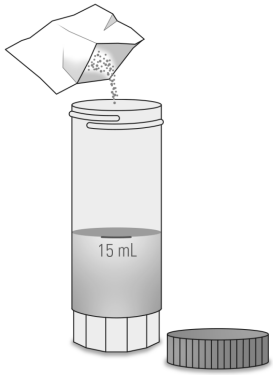

Figure 1. Empty the Zinc Foil Pack contents into the reaction tube.

3. Add 10 drops of A-6901 acidifier solution to the empty 25 mL sample cup, as shown in Figure 2.

Figure 2. Adding acidifier solution to the sample cup.

4. Pour the treated sample from the reaction tube into the sample cup, being careful not to transfer any solid material to the sample cup.

NOTE: Getting a small amount of solid material into the sample cup will not affect the results.

5. Place the ezSample Snap Vial (ampoule) tip into a depression at the bottom of the sample cup. Snap the tip by pressing the ampoule against the side of the cup, as shown in Figure 3. The ampoule will fill, leaving a small bubble to facilitate mixing.
6. Mix the contents of the ampoule by inverting it several times, allowing the bubble to travel from end to end. Dry the ampoule and wait 10 minutes for color development.
7. Use the colorimeter to measure the concentration value of the ampoule. Refer to the colorimeter's manual for calibration and data collection instructions.

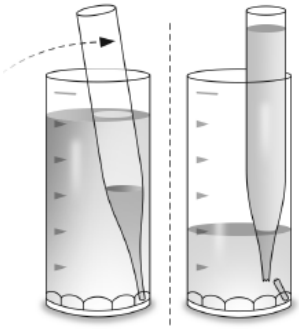

Figure 3. Snapping the tip off of the ampoule.

Nitrite-nitrogen

Use the results from the nitrate-nitrogen test procedure to measure nitrate in the presence of up to 0.4 ppm (mg/L) nitrite-nitrogen (NO_2-N) by difference.

1. Fill the 25 mL sample cup to the 15 mL mark with the test sample.
2. Place the ezSample Snap Vial (ampoule) tip into the depression at the bottom of the sample cup. Snap the tip by pressing the ampoule against the side of the cup, as shown in Figure 3. The ampoule will fill, leaving a small bubble to facilitate mixing.

3. Mix the contents of the ampoule by inverting it several times, allowing the bubble to travel from end to end. Dry the ampoule and wait 10 minutes for color development.
4. Use the colorimeter to measure the concentration value of the ampoule.
5. If the test result obtained for nitrite-nitrogen is less than 0.4 ppm, use this test result to subtract from a nitrate-nitrogen test result to obtain accurate results for nitrate-nitrogen in the presence of low levels of nitrite-nitrogen.

Recommended disposal procedures

Once you are finished with the nitrate ezSample Snap Vials, gather the vial contents into a properly labeled secondary container. Dispose of this container in accordance with your local waste regulations through a chemical waste management company.

Test method description

The nitrate ezSample test method employs the zinc reduction method. Nitrate is reduced to nitrite in the presence of zinc. In an acidic solution, the nitrite diazotizes with a primary aromatic amine and then couples with another organic molecule to produce a highly colored azo dye. The resulting pink-orange color is proportional to the nitrate concentration.

Results are expressed in ppm (mg/L) NO_3-N. To convert to ppm (mg/L) nitrate as NO_3, multiply test results by 4.4.

References

Method 4500-NO3 E APHA Standard Methods, 20th ed., p. 4-117, (1998)

Nitrite-Nitrate in Water, Test Method B, ASTM D 3867 - 99

Method 353.3 EPA Methods for Chemical Analysis of Water and Wastes, (1983)

Nelson, J. L., Kurtz, L.T., and Bray, R.H. Rapid Determination of Nitrates and Nitrites, Analytical Chem., V26, p. 1081-2 (1954)

Accuracy

The lower limit of the stated test range is the practical detection limit (PDL). Accuracy may be compromised if test results are outside of the test range. For best accuracy, further confirm test results obtained at or below the PDL.

Specifications and accessories

Visit the product page at pasco.com/product/EZ-2333B to view the specifications and explore accessories. You can also download experiment files and support documents from the product page.

Experiment files

Download one of several student-ready activities from the PASCO Experiment Library. Experiments include editable student handouts and teacher notes. Visit pasco.com/freelabs/EZ-2333B.

Technical support

Need more help? Our knowledgeable and friendly Technical Support staff is ready to answer your questions or walk you through any issues.

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Regulatory information