

Nitrate ezSample™ (EZ-2333B) 0.25-2.00 ppm (mg/L) as N

Instrument Set-up

The PASPort Water Quality Colorimeter is specifically designed to support PASCO's ezSample™ test kits. Set up the PASPort Water Quality Colorimeter according to the equipment instructions. Set your display to read both high and low nitrate values. If the readings are above 1.0 mg/L, then use the Nitrate High reading (Nitrate High (H)). If the readings are below 1.0 mg/L, use the Nitrate Low reading (Nitrate Low (L)). Readings at 1.0 mg/L are accurate on both scales. The calibration procedure is listed on the equipment instruction card.

This kit requires the use of the following software versions;
SPARKvue 2.2.1 or later
PASCO Capstone 1.3.1 or later

For use with the SPARK Science Learning System or Xplorer GLX please visit the Chlorine ezSample product page to download a configuration file with the correct calibration curves for the Chlorine (EZ-2339A) and Nitrate (EZ-2333B) test kits.

Safety Information

Read the Material Safety Data Sheet (MSDS) before performing this test procedure. Wear safety glasses and disposable gloves.

Test Procedure

1. Fill the **reaction tube** (green screw cap tube) to the 15 mL mark with the sample to be tested.
2. Empty the contents of one Zinc Foil Pack into the reaction tube. Cap the reaction tube and shake it vigorously for exactly **2 minutes**. (fig. 1)
3. Add 10 drops of A-6901 Acidifier Solution to the empty **25 mL sample cup** (fig. 2).

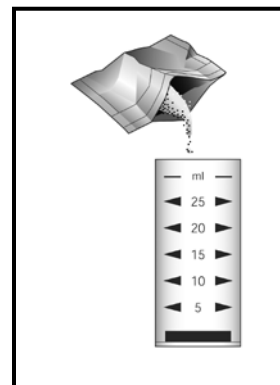


Figure 1

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) in the sample cup. Snap the tip by pressing the ampoule against the side of the cup. The ampoule will fill leaving a small bubble to facilitate mixing (fig 3).
 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

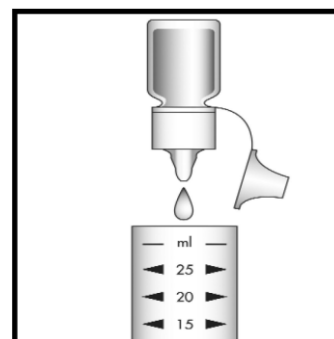
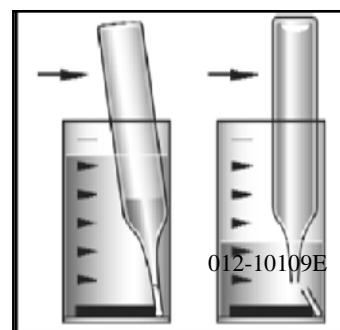


Figure 2

7. Use the PASPort Water Quality Colorimeter to measure the concentration value of the ampoule



Test Method Description

The nitrate ezSample test method employs the zinc reduction method.^{1,2,3,4} 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) NO₃-N. To convert to ppm (mg/L) nitrate as NO₃, multiply test results by 4.4.

This test method is applicable to industrial wastewater, drinking water, surface water and seawater.

Test Procedure for Nitrite Nitrogen

This kit can also be used to measure nitrate in the presence of up to 0.4 ppm (mg/L) nitrite nitrogen (NO₂-N) by difference using the following procedure:

- A. Fill the 25 mL sample cup to the 15 mL mark with sample.
- B. Follow steps 5 through 7 of the test procedure to obtain a test result for nitrite-nitrogen in the sample.
- C. If the test result obtained for nitrite-nitrogen is less than 0.4 ppm, this test result can be subtracted from a nitrate-nitrogen test result (obtained on a separate aliquot of sample by following the full test procedure (Steps 1 through 7) to obtain accurate results for nitrate-nitrogen in the presence of low levels of nitrite-nitrogen.

Accuracy and practical detection limit (PDL)

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. Test results obtained at or below the PDL should be further confirmed for best accuracy.

References

1. Method 4500-NO₃ E APHA Standard Methods, 20th ed., p. 4-117, (1998)
2. Nitrite-Nitrate in Water, Test Method B, ASTM D 3867 - 99
3. Method 353.3 EPA Methods for Chemical Analysis of Water and Wastes, (1983)
4. Nelson J. L., Kurtz, L. T., and R. H. Bray, R.H. Rapid Determination of Nitrates and Nitrites. Analytical Chem., V26, p 1081-2 (1954)