Nitrate – NED / Zinc Reduction Method

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Applications and Industries

Freshwater, Seawater and Industrial water

References

- Nelson J. L., Kurtz, L. T., and R. H. Bray Rapid Determination of Nitrates and Nitrites. Analytical Chem., V26, p 1081-2 (1954)
- APHA Standard Methods, 23rd ed., Method 4500-NO2 - B - 2000.
- EPA Methods for Chemical Analysis of Water and Wastes, Method 354.1 (1983).

Chemistry

Nitrate is reduced to nitrite by shaking the sample with a zinc metal catalyst and a citrate buffer. The nitrite is reacted with sulfanilic acid and N-(1-naphthyl)ethylenediamine dihydrochloride (NED) in an acidic solution to produce a intense reddish-purple azo dye. Results are expressed as ppm (mg/L) nitrate-nitrogen (NO3-N). This method is applicable to industrial wastewaters, drinking, and surface waters. These Nitrate in water test kits can also be used for the analysis of seawater. To convert results from ppm NO_3-N to ppm NO_3, multiply by 4.43.

Available Analysis Systems

Visual colorimetric: CHEMets®, HR CHEMets®
Instrumental colorimetric: Vacu-vials®

Storage Requirements

Products should be stored in the dark at room temperature.

Correction for Nitrite

This method will measure nitrate in the presence of low levels of nitrite:

$$\text{Corrected Nitrate, ppm NO3-N} = \text{Total (K-6973, ppm NO3-N)} - 1.14 \times \text{Nitrite(K-7013, ppm NO2-N)}$$

Note: *K-7013 NO2-N is equivalent to the K-6973 test without the addition of the Zinc powder and S-6902 (buffer), but with 5 drops of S-7004 (acidifier).*

Interference Information

- Cupric copper [Cu(II)] – Negative bias above 0.3 mg/L Cu(II).
- Ferrous Iron [Fe(II)] - 1% bias/mg/L Fe(II)
- Alkalinity – Negative bias above 500 mg/L CaCO3 alkalinity, adjust the sample to pH 6 with HCl.
- For sample color or turbidity use CHEMetrics' Sample Zeroing Accessory Pack.
- Chromate interferes by causing the formation of a yellow color. **CHEMetrics' Sample Zeroing Accessory Pack (A-0025)** can be used to correct for potential errors during instrumental analysis.

Accuracy Statement

Statements of accuracy are based on laboratory tests performed under ideal testing conditions using standards of known concentration prepared in deionized water.

Visual colorimetric:
CHEMets® kits: ± 1 color standard increment

Instrumental colorimetric
Vacu-vials® kit, K-6973:
≤ 0.04 ppm at 0 ppm NO_3-N
± 0.03 ppm at 0.10 ppm NO_3-N
± 0.20 ppm at 1.125 ppm NO_3-N
Vacu-vials® kit, K-6983 (High Range 10X):
≤ 0.40 ppm at 0 ppm NO_3-N
± 0.3 ppm at 1.0 ppm NO_3-N
± 2.0 ppm at 11.25 ppm NO_3-N

Safety Information

Safety Data Sheets (SDS) are available upon request and at www.sdsfetch.com. Read SDS before using these products. Breaking the tip of an ampoule in air rather than water may cause the glass ampoule to shatter. Wear safety glasses and protective gloves.