Technical Specification

Tests For: Nitrate in Natural, Drinking and Waste water

Test Range: 0–30 mg/L N, 0–150 mg/L NO_3

Reagent Chemistry Used: Chromotropic acid

Method Detection Limit*: 0.65 mg/L

Limit of Quantification**: 2.08 mg/L

*The Method Detection Limit (MDL) is defined as the minimum measured concentration of a substance that can be reported with 99% confidence to be different from the method blank results.[i]

**The Limit of Quantification (LOQ) is the smallest quantity that can be detected with reasonable certainty for a given analytical procedure. [ii]

Testing for Nitrate

Nitrates are normally present in natural, drinking and waste waters. Nitrates enter water supplies from the breakdown of natural vegetation, the use of chemical fertilisers in modern agriculture and from the oxidation of nitrogen compounds in sewage effluents and industrial wastes. Nitrate is an important control test for water supplies. Drinking waters containing excessive amounts of nitrates can cause methaemoglobinaemia in bottle-fed infants.

The Palintest Tubetests Nitrate/30N method provides a simple test for nitrate over the range 0–30 mg/L N (0–150 mg/L NO_3).

Reagent Chemistry

In the Palintest Tubetests Nitrate/30N method, nitrate reacts with chromotropic acid under strongly acidic conditions to produce a yellow colour. The reagents are provided in the form of a pre-dispensed tube and a powder. The test is simply carried out by adding a sample of the water and a scoop of powder to a tube.

The intensity of the colour produced in the test is proportional to the nitrate concentration and is measured using a Palintest Photometer.

Interferences

The test system incorporates reagents to prevent potential interferences from nitrite, chloride, iron (Fe (III)), chlorine and other oxidising agents. Interference studies have shown that levels up to nitrite 10 mg/L, chloride 1,000 mg/L, iron 40 mg/L and chlorine 5 mg/L do not affect the result of the test.

Best Practice Advice for Testing

- The Palintest Tubetest Nitrate test is a simplified laboratory procedure and should be carried out in accordance with good laboratory working practice.

- The reagent tubes contain 90% sulphuric acid and must be handled with care. The use of appropriate protective clothing, gloves and safety spectacles is recommended. In the event of skin or eye contact, or spillage, wash immediately with large amounts of water.

- Particular care should be taken when opening the reagent tubes to add the water sample as heat will be produced and gases may be evolved.

- Samples containing cyanide or sulfide will release toxic fumes and for such samples, the test must always be carried out in a fume cupboard. It is generally recommended that the test be conducted in a fume cupboard where available.

- Tubetests Nitrate Powder is light sensitive. Store in original pack and keep lid closed when not in use.

- The used Tubetests Nitrate/30N Tubes contain strong sulphuric acid and other chemical reagents, and care must therefore be exercised in their disposal. The tube contents must be disposed of in accordance with waste regulations and the laid-down disposal procedures of the laboratory of use.

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[i] EPA, Definition and Procedure for the Determination of the Method Detection Limit, Revision 2, Dec 2016.
[ii] *IUPAC. Compendium of Chemical Terminology, 2nd ed. (the "Gold Book").*