

TUBETESTS® NITRATE/30N

TEST FOR NITRATE IN NATURAL,
DRINKING AND WASTE WATER

Photometer Method

**AUTOMATIC
WAVELENGTH
SELECTION**

**0 – 30 mg/l N
0 – 150 mg/l NO₃**

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 (blue babies). The EEC has set a recommended maximum level of 25 mg/l NO₃ (5.7 mg/l N) and an absolute maximum of 50 mg/l NO₃ (11.3 mg/l N) for nitrate in drinking water.

The Palintest Tubetests Nitrate/30N method provides a simple test for nitrate over the range 0 - 30 mg/l N (0 - 150 mg/l NO₃).

Note that the Tubetests Nitrate/30N reagent system is also used in the colour development stage of the Palintest Tubetests Total Nitrogen/30 test. See Instruction Sheet Phot.89 for the test instructions for this test.

Method

In the Palintest Tubetests Nitrate/30N method, nitrate reacts with chromotropic acid, under strongly acidic conditions to produce a yellow colour. Chemicals are incorporated to prevent interference from nitrite, chloride, iron (Fe^{III}), chlorine and other oxidising agents. The reagents are provided in the form of a predispensed 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.

Working Practice

The Palintest Tubetests 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 sulphide 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.

Reagents and Equipment

Palintest Tubetests Nitrate/30N Tubes

Palintest Tubetests Nitrate Powder

Palintest Automatic Wavelength Selection Photometer

Palintest Pipettor, 1 ml (PT 574)

Palintest Dosing Scoop - Size 1 (PT 691)

Palintest Dosing Funnel (PT 690)

Palintest Dosing Scoop Scraper (PT 695)

Use of Dosing Scoop and Funnel

This Tubetests method uses a Palintest Dosing Scoop and Funnel. The scoop and funnel are specially designed to ensure accurate dosing of reagent powders into the Tubetests tubes :-

- 1 Dip the scoop into the powder and ensure that it is completely filled. Draw the scraper across the top of the scoop to ensure a level fill.
- 2 Place the funnel on top of the Tubetests tube. Locate the scoop in the groove on the side of the funnel. Rotate the scoop to invert then tap gently to ensure that all the reagent goes into the tube.

Test Instructions

- 1 Remove the cap of the Tubetests Nitrate/30N Tube and add 1.0 ml of sample using a pipettor. For optimum results, the sample should be added slowly without disturbing the contents of the tube. DO NOT SHAKE THE TUBE.
- 2 Add one level scoop of Tubetests Nitrate Powder using a Size 1 dosing scoop. Cap tube and gently invert five or six times to dissolve and mix the reagents and sample.
- 3 Stand for five minutes to allow colour development.
- 4 Select Phot 87 on Photometer for results as mg/l N or Phot 88 for results as m/l NO₃.
- 5 Take photometer reading in usual manner (see Photometer instructions). Use an unused Tubetests Nitrate tube to set the blank on the photometer.

Interferences

The test system incorporates reagents to prevent potential interferences from nitrite, chloride, iron (Fe^{III}), and 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 effect the result of the test.

Notes

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