

INSTRUCTIONS
144-90
NITRATE ION TEST KIT

The OFI Nitrate Ion Test Kit was specifically designed for reading the concentration of tracer nitrate ions in drilling fluids under oilfield conditions, by people with extensive experience in oilfield research problems. The kit does not contain liquids and the reagent mixtures are stored in individually sealed plastic ampoules where moisture, air, heat or cold have the least possible effect on them. Results are available in ppm NITRATE rather than ppm NITROGEN, which is not as readily useful in tracer work. Elapsed time for a test is 13 minutes, exclusive of any filtering. The range for a direct sample is 0 – 10 ppm, and diluting 1 to 5 gives a 50 ppm range with a maximum dilution of 1 to 20 yielding a 0 – 200 ppm range. This is a very accurate field test for Nitrate ions.

Components:

- #140-56 Filter Paper, 12.5 cm, 100/pkg
- #144-90-03 Comparator Box and Color Wheel
- #144-90-04 Test Tube Rack, 8 tube capacity
- #144-90-05 Dropper Pipette, 2 ml, polyethylene
- #144-90-06 Test Tube, 150 x 18 mm, with no. 1 rubber stopper
- #153-12 Graduated Cylinder, 100 x 1 ml, glass
- #153-18 Graduated cylinder, 10 x 2/10 ml, glass
- #153-30 Funnel, 3 inch, polyethylene
- #153-34 Pipette, 1 x 1/100 ml, glass
- #153-51 Beaker, 250 ml, glass
- #297-08 Bottle, poly, natural boston round, with cap, 4 oz

Reagents:

- #144-90-01 Calcium Hydroxide, (low nitrate), 8 oz
- #144-91 NO₃⁻¹¹ Nitrate Test Reagent, 100/pkg
- #144-92 NO₃⁻¹² Nitrate Test Reagent, 100/pkg

Case:

- #144-90-07 Carrying Case, Nitrate Test Kit

Sample Preparation:

1. Testing a clear and colorless WATER sample for Nitrate ion concentration:
 - A. Proceed to Procedure item 1A below and formulate.

2. Testing a MUD sample for Nitrate ion concentration.
 - A. Filter about 50 mls of filtrate out of a Filter Press
 - B. Go to Procedure, section 1 below.
 - If the filtrate is BROWN.***
 - C. Dilute 5 mls of filtrate to 30 mls of deionized water.
 - D. Add 1 tablespoon of low nitrate Calcium Hydroxide
 - E. Shake well and then filter with the funnel.
(The Dilution is 6:1)
 - E. Go to Procedure, section 1 below
 - If the filtrate is still too BROWN:***
 - F. Repeat the above dilution and treatment then filter again
(Another 6:1 dilution)
 - G. Go to Procedure, section 1 below

Procedure:

1. Selecting the test range and diluting:

A.	10 ppm Range: 5 ml sample taken directly	$\frac{\text{Dial Reading}}{10} = \text{ppm}$
B.	50 ppm Range: Dilute 1:5 then take a 5 ml sample	$\frac{\text{Dial Reading}}{2} = \text{ppm}$
C.	100 ppm range: Dilute 1:10 then take a 5 ml sample	$\text{Dial Reading} = \text{ppm}$

2. Developing the Color:
 - A. Measure 5 ml of sample into a test tube
 - B. Add the NO_3^{-11} ampoule contents and shake for a full 3 minutes.
 - C. Let all particles settle and decant the clear liquid into a second test tube.
 - D. Add the NO_3^{-12} ampoule contents then shake for ½ minute.
 - E. Place the test-tube in the rack and let the color develop fully.

3. Reading the Nitrate Ion Concentration
 - A. Pour the colored sample into the 10 ml graduated cylinder.
 - B. Add enough water to make the fluid volume read 10 mls.
 - C. Return the liquid to the test tube.
 - D. Insert the test tube into the RIGHT top hole of the Comparator Box.
 - E. Pour 10 mls of the PLAIN untreated sample solution (same dilution) into another test tube and place in the left hand hole of the Comparator Box. This will be the BLANK.
 - F. With adequate light behind the Comparator Box slowly rotate the disk until the COLOR INTENSITY of the disk (against the blank) matches that of the sample.
 - G. Note the dial reading. Add this value to the formula in item 1 for the 5 ml sample based upon the test range chosen. This will be the ppm NITRATE ION of the 5 ml sample.

4. If the sample color falls within the range of the color wheel.
 - A. If dilutions were made in treating a colored filtrate with Calcium Hydroxide, the reading Must be multiplied by the dilution amount in order to find the concentration of ion in the original mud filtrate.

5. If the sample color is DARKER than the wheel color at a reading of 1.0.
 - A. Estimate the dilution needed to reduce the nitrate ion concentration to the range desired.
 - B. Make the dilution and run the test again.

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