

NITRATE-NITROGEN-LOW RANGE

CADMIUM REDUCTION METHOD • CODE 3649-SC

| QUANTITY | CONTENTS | CODE |
|-----------|---------------------------|-----------|
| 2 x 60 mL | *Mixed Acid Reagent | *V-6278-H |
| 5 g | *Nitrate Reducing Reagent | *V-6279-C |
| 1 | Spoon, 0.1 g, plastic | 0699 |
| 1 | Dispenser Cap | 0692 |

*WARNING: Reagents marked with an * are considered hazardous substances. To view or print a Material Safety Data Sheet (MSDS) for these reagents see MSDS CD or our web site. To obtain a printed copy, contact us by e-mail, phone or fax.

Nitrogen is essential for plant growth, but the presence of excessive amounts in water supplies presents a major pollution problem. Nitrogen compounds may enter water as nitrates or be converted to nitrates from agricultural fertilizers, sewage, industrial and packing house wastes, drainage from livestock feeding areas, farm manures and legumes. Nitrates in large amounts can cause “blue babies” (methemoglobinemia) in infants less than six months of age. Nitrate concentration is an important factor to be considered in livestock products, where, in addition to causing methemoglobinemia, it is responsible for many other problems. Nitrates in conjunction with phosphate stimulate the growth of algae with all of the related difficulties associated with excessive algae growth.

U.S. Public Health Service Drinking Water Standards state that 10 ppm nitrate nitrogen should not be exceeded. To the sanitary and industrial engineer, concentrations of less than 1 ppm are acceptable.

APPLICATION: This method determines nitrate levels in drinking, surface, saline waters, domestic and industrial waters.

RANGE: 0.00–3.00 ppm Nitrate Nitrogen

METHOD: Powdered cadmium is used to reduce nitrate to nitrite. The nitrite that is originally present plus reduced nitrate is determined by diazotization of sulfanilamide and nitrite followed by coupling with N-(1 naphthyl)-ethylenediamine dihydrochloride to form a highly colored azo dye which is measured colorimetrically.

SAMPLE HANDLING & PRESERVATION: Analysis should be made as soon as possible. If analysis cannot be made within 24 hours, the sample should be preserved by refrigeration at 4°C. When samples must be stored for more than 24 hours, they can be preserved by adding 2 mL of concentrated sulfuric acid per liter of sample. For best results, the analysis for nitrate should be determined at temperatures between 20°C and 25°C.

INTERFERENCES: Nitrite interferes at all levels. Use the following equation to compensate for nitrite interferences:

$$\text{true Nitrate-N reading} = \text{Test result (ppm)} - (\text{Nitrite-N [ppm]} \times 5.5)$$

Strong oxidizing and reducing substances interfere. Low results might be obtained for samples that contain high concentrations of iron and copper.

PROCEDURE

- ☑ NOTE: Place Dispenser Cap (0692) on *Mixed Acid Reagent (V-6278). Save this cap for refill reagents.
- 1. Press and hold **ON** button until colorimeter turns on.
- 2. Press **ENTER** to start.
- 3. Press **ENTER** to select TESTING MENU.
- 4. Select ALL TESTS (or another sequence containing 64 Nitrate-N LR) from TESTING MENU.
- 5. Scroll to and select 64 Nitrate-N LR from menu.
- 6. Rinse a clean tube (0290) with sample water. Fill to 10 mL line with sample.
- 7. Insert tube into chamber, close lid and select SCAN BLANK.
- 8. Remove tube from colorimeter and pour off 5 mL into graduated cylinder or similar. Discard the remaining sample.
- 9. Pour the 5mL sample from a graduated cylinder or similar into the tube. Use the graduated cylinder or similar to measure 5 mL of *Mixed Acid Reagent (V-6278) and add to tube. Cap and mix. Wait 2 minutes before proceeding to Step 10.
- 10. Use the 0.1 g spoon (0699) to add two measures of *Nitrate Reducing Reagent (V-6279). Cap.
- 11. Hold tube by index finger and thumb and mix by inverting approximately 50-60 times a minute for four minutes. Wait 10 minutes for maximum color development.
 - ☑ NOTE: At end of waiting period an undissolved portion of Nitrate Reducing Reagent may remain in bottom of the tube without affecting results.
- 12. At the end of the 10 minute waiting period, mix, insert tube into chamber, close lid and select SCAN SAMPLE. Record result.
- 13. Press **OFF** button to turn colorimeter off or press **EXIT** button to exit to a previous menu or make another menu selection.
- ☑ NOTE: For best possible results, a reagent blank should be determined to account for any contribution to the test result by the reagent system. To determine the reagent blank, follow the above test procedure to scan a distilled or deionized water blank. Then follow the above procedure to perform the test on a distilled or deionized water sample. This test result is the reagent blank. Subtract the reagent blank from all subsequent test results of unknown samples. It is necessary to determine the reagent blank only when a new lot number of reagents are obtained.

To convert Nitrate Nitrogen (NO₃-N) results to ppm Nitrate (NO₃), multiply by 4.4.

