

Water – A Shared Responsibility

Nitrate in Waste Water

This ion selective electrode method is to directly read Nitrate in waste water. Laboratory productivity is improved with quick, uncomplicated determinations. Use of the Nitrate interference suppressor solution (ISS) frees the ISE method from most interferences and holds the pH and ionic strength of all samples and standards constant.

Required equipment

- ISE meter, such as the METTLER TOLEDO SevenMulti™ benchtop meter or the SevenGo pro™ portable meter or any meter with a mV mode
- perfection™ combined nitrate ion selective electrode (P/N 51344727)
- Stirrer
- Volumetric flasks, graduated cylinders and beakers
- Ion Electrolyte F Reference filling solution (P/N 51344755)
- Nitrate standards at 1, 10 and 50 mg/L. Nitrate standard solution 1000 mg/L (P/N 51344779). For serial dilution see electrode guidebook.
- Nitrate Interferences Suppressor Solution (ISS) (P/N 51344764)
- Deionized water (DI)

Electrode setup

See the electrode guidebook for (assembling and) preparation of the electrode.

Electrode performance check

Check slope at least daily according to the electrode guidebook. Drift may be checked by comparing a 1 minute to a 2 minute reading. Results should agree with desired criteria. See troubleshooting section of electrode guidebook if there are slope or drift problems.

Electrode storage, soaking, and rinsing

For storage between measurements and up to three days, store the electrode in a 100 mg/L nitrate standard. For long periods of time, store dry. See electrode guidebook for details on dry storage. Between measurements, rinse the electrode with DI water and shake the electrode to dry the sensing element. Do not wipe or rub the sensing element of the electrode.



Meter setup

Connect the electrode to the meter and follow the meter user guide for ion measurement. Select resolution of 3 digits, concentration units of mg/L (ppm) and manual endpoint format.

Sample preservation

Samples must be analyzed within 48 hours of collection and should be stored at <6 °C. Refer to EPA 40 CFR Part 136.3 for details.

Sample preparation

Measure 10 mL of sample and 10 mL of nitrate ISS into a 50 mL beaker. Nitrate ISS must be added to all standards and samples. A larger sample size can be used if desired as long as Nitrate ISS is added in a 1:1 ratio. For precise measurements, allow all standards and samples to reach the same temperature before analysis.

Calibration

Perform a three point calibration using 1, 10 and 50 mg/L nitrate standards with nitrate ISS. After calibration, the electrode slope will be displayed and should be above 54 mV/decade. Read a fresh portion of a standard to verify the calibration. If the reading is not acceptable, see troubleshooting section of the electrode guidebook.

Analysis

Rinse the electrode with DI water and dry the outer sleeve of electrode to remove drops. Place the electrode in the sample, stirr and measure until a stable reading is achieved. The concentration of the sample will be displayed. See Table for typical measurement results.

Typical measurement results

Waste water	mg/L (ppm) Nitrate
Sample 1	11.80
Sample 2	11.60
Sample 3	11.90
Mean	11.77
Standard deviation	0.153



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