Series 8006

Nitrate Electrode

- **Fast and accurate response**
- **Highly selective**
- **Robust construction**
- **Easy to use**
- **Replaceable capsule for easy maintenance**

General Nitrate Measurements

The nitrate electrode Model 8006 enables precise determinations of nitrate concentrations in solution to be made in minutes.

Applications

The nitrate electrode has been used in a wide range of applications including:

Water – waste water, river water and potable waters.

Food and beverages industries – bacon, pressed meats, spinach, potatoes, sugar beet and baby foods.

Biological – soils and plant tissue.

Theory

The nitrate electrode and the reference electrode when immersed in a sample constitute an electrochemical cell whose potential is dependent on the nitrate ion activity in the sample. The potential of the cell has a value given by the Nernst Equation.

Range

Model 8006 has a linear (Nernstian) response in the range 10^{-1}M NO_3^- to $5x10^{-5}$M NO_3^-. But with careful calibration this can be extended to the detection limit of 10^{-6}M.

ABB Instrumentation

Response Time

The response time of Model 8006 is temperature dependent. At 25°C the response time for a decade change in concentration from 10^{-4} M to 10^{-5} M is typically 10 seconds. This rises to only 30 seconds at very low levels, i.e. 10^{-6}M.

Temperature

This electrode can be used over the range 5 to 40°C but as its response time is temperature sensitive, samples and standards must be of similar temperature.

Selectivity

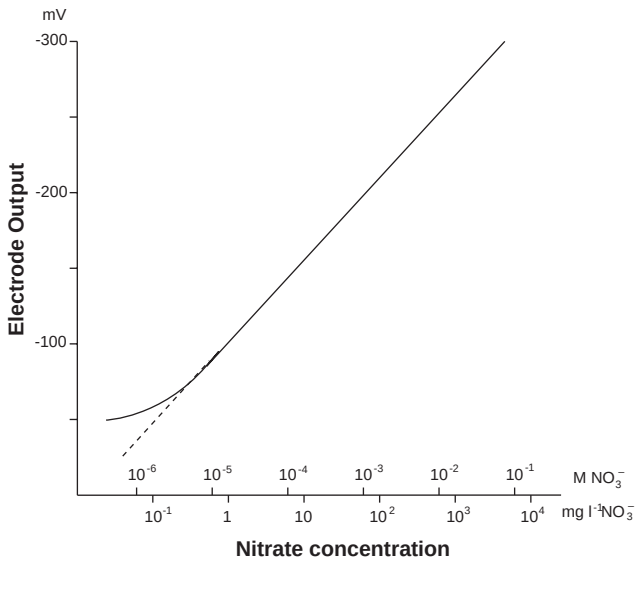
The membrane design ensures the electrode is very selective but low level interference occurs from chloride ions. However, sensitivity to chloride is about 1000x less than to nitrate.

Reproducibility

Better than 2% of concentration.

Drift

Less than 1mV in 12 hours.



Typical Calibration Curve

Calibration

A 2-point calibration is recommended with concentration points a decade apart – for example 10ppm and 100ppm. These points can then be plotted on semi-log paper as a calibration curve.
Alternatively, if your pH/mV meter will display concentration directly, then follow meter manufacturer's advice.

Application Advice

Ensure that significant concentrations of chloride, iodide or bromide are absent. High concentrations of detergents may shorten electrode life.
The nitrate electrode measures the activity and hence concentration of nitrate ions in aqueous solution. No tiresome sample pre-treatment is required as the Model 8006-2 can be used in coloured or turbid samples. When connected to a meter having a concentration scale, direct concentration read-out is obtained, eliminating the need for calibration graphs.
Traditional methods for nitrate estimation are both time consuming and inconvenient to perform. Model 8006 is simple to use, can be standardised in minutes and gives rapid, reproducible results. Furthermore, the exceptional stability of the electrode makes frequent standardisation checks unnecessary. The electrode is of the capsule design so that no special assembly techniques are required. Maintenance is minimal.

Nitrate and the Environment

The measurement of nitrate is particularly important in the water industry; high nitrate levels together with low ammonia levels indicate that a river is clean and desirable oxidising conditions prevail. In the summer, high nitrate levels combined with high phosphate promote eutrophication, leading to obstructed waterways and tainted water supplies. High nitrate levels in drinking water are also a health hazard, particularly in young children. The current European limit for nitrate levels in drinking water is 50ppm.

Reference

A mercurous sulphate reference electrode type 1433-510 must be used, other types will cause interference.

Electrode Range

8006-205 – BNC
8006-050 – detachable cable

For further information please contact your local distributor or our sales office at Stonehouse.

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