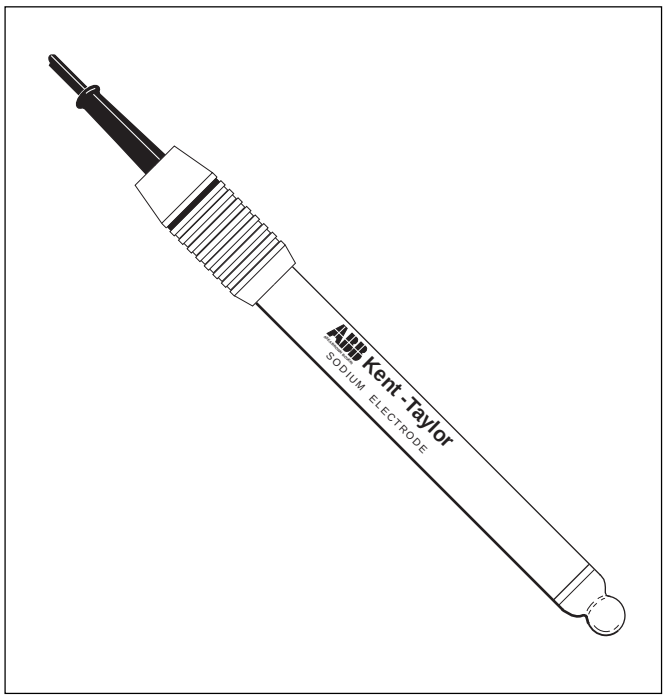
Series 1048

Sodium Electrode

- **Fast and accurate response**
- **High sensitivity**
- **Low and high level options**
- **Easy to use**



General Sodium Measurements

The sodium electrode Model 1048-2 enables precise determinations of sodium concentrations in solution to be made in minutes. A specially treated electrode, Model 1048-4, is available for low level sodium measurements.

Applications

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

Water – boiler water, river water and potable waters.

Food and beverages industries – bacon, pressed meats, wines and beer.

Biological – soils, serum, urine, sweat and saliva.

ABB Instrumentation

Theory

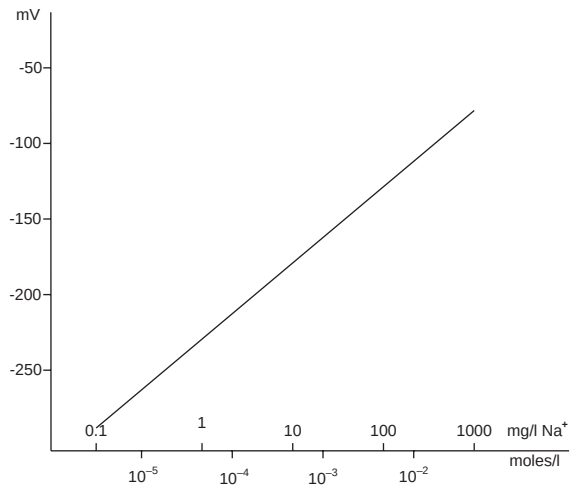
The sodium electrode and the reference electrode when immersed in a sample constitute an electrochemical cell whose potential is dependent on the sodium ion activity in the sample. The potential of the cell has a value given by the Nernst Equation.

Range

Model 1048-2 has a linear (Nernstian) response in the range 10^{-1}M Na^+ to $5x10^{-5}$M Na^+ (2300mgl^{-1} to 1mgl^{-1}). By using a specially treated electrode, Model 1048-4, incorporated in a flow system this range may be extended down to $5x10^{-9}$M (0.1 µgl^{-1}) .

Response Time

The response time of Model 1048 is temperature dependent. At 25°C the response time for a decade change in concentration from 10^{-4}M to 10^{-3}M is typically 15 seconds, but the same change takes 85 seconds at 10°C.



Typical Calibration Curve

Temperature

The sodium electrode can be used over the range 0 to 80°C but as its response time is temperature sensitive, samples and standards must be of similar temperature.

Selectivity

Significant interference occurs from hydrogen ions if pH < pNa + 3 and from silver ions if $Ag^+ > 10^{-4} \times Na^+$.

Reproducibility

Better than 2% of concentration.

Drift

Less than 1mV in 12 hours.

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 pH > pNa+3, i.e. that the concentration of hydrogen ions is at least 1000x less than the sodium concentration. This usually means measurements are made in alkaline conditions.

Reference

Use calomel reference electrode type 1431-510

Electrode Range

1048-205 Sodium (high level) - BNC
1048-250 Sodium (high level) - detachable cable
1048-405 Sodium (low level) - BNC
1048-450 Sodium (low level) - detachable cable

Other terminations are available on request.

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

ABB Kent-Taylor Ltd.
Analytical & Flow Group
Stonehouse, Glos.
England, GL10 3TA
Tel: +44 (0) 1453 826661
Fax: +44 (0) 1453 827856

ABB Kent-Taylor Ltd.
St. Neots
Cambs.
England, PE19 3EU
Tel: +44 (0) 1480 475321
Fax: +44 (0) 1480 217948

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