

Instruction manual for the SCHOTT® Instruments electrodes for measuring the Na⁺ concentration



Preparation and general

If there is an irrigation cap over the sensor and diaphragm, this should be removed. It contains irrigation fluid (sodium chlorid solution 0.1 mol/l). The electrode is ready to perform a measurement. Electrodes stored dry must be irrigated for 24 hours in irrigation fluid. Lacking electrolyt solution 3 M potassium chlorid solution (L 3008) should be refilled. The filling level of the electrode solution should always be at least 5 cm above the level of the measurement solution.

Attention!

Electrolyte solution and irrigation fluid are different.

The closure of the refilling hole must be opened during measurement. The membrane and diaphragm must be immersed in the measurement solution. Please also note the instruction manual of the measuring device.

For calibration following standard solutions are needed:

0.1 M NaCl

Dissolve 5.85 g sodium chloride in approximately 800 ml distilled water and fill it up to 1 l.

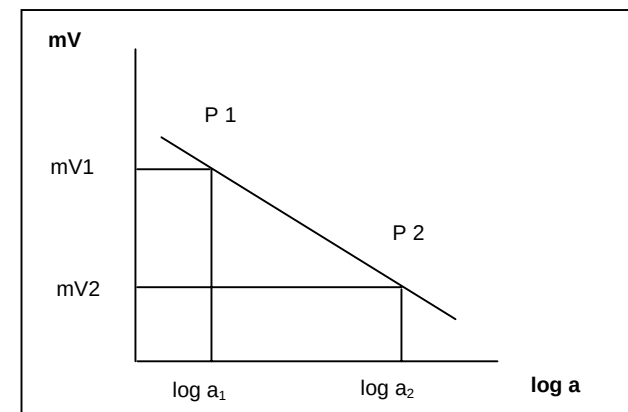
0.001 M NaCl

Dilute 10 ml of the 0.1 M NaCl solution up to 1 l with distilled water.

Calibration

The pNa electrode should be connected to the pH-meter like a pH electrode. Switch the pH-meter in the mV range. For calibration begin with the lowest concentration and without rinsing the next solution is measured. The resulting mV value is noted and a calibration curve printed. The pNa electrode follows the Nernst equation. The temperature of the solution must be taken into account.

Example calibration curve



Measurement

The measured solution should be slightly alcalic, but at least have a pH of 6. Is this not the case, the pH can be adjusted with sodium free bases like ammonia water or triethanolamine.

Attention!

Do not take sodium hydroxide solution for adjusting the pH.

The response of the pNa electrode is slow. For a stable signal it takes from 10-40 min. A shorter waiting time can be reached when the electrode is rinsed before measuring with the new solution or an alcalic buffer solution is added.

Cleaning

Dirt and contamination on the sensor and diaphragm lead to measurement inaccuracies. They can be removed with the following procedure:

- **Coatings and deposits** can be removed with diluted mineral acids (e.g. diss. hydrochloric acid)
- **Organic contaminations** with the aid of suitable solvents
- **Grease** with tensid solution or alcohol
- **Proteins** with hydrochloric pepsine solution (cleaning solution L 510).

During maintenance there is to pay attention to:

- After cleaning, rinse off the electrodes with distilled water, do not rub dry.
- Platinum diaphragms must not be treated by any mechanical treatment. Rinsing (e.g. vacuuming) may be followed by chemical cleaning (e.g. with diluted hydrochloric acid).
- The glass membrane can be cleaned by rubbing off with a fluff-free cloth soaked in ethanol.

Storage and maintenance

Electrodes should be stored at a temperature between 0°C and 40°C. Depending on the storage conditions (temperature and air humidity) the irrigation fluid in the cap may dry out prematurely. pNa electrodes stored dry must be irrigated for minimum 24 hour in sodium chlorid solution 0.1 mol/l before measurement. Crystals in the electrolyte area can be dissolved by warming the electrode in a water bath. The electrolyte solution should then be replaced.

The correct potassium chlorid concentration must be observed.

Quality

Every electrode must fulfill the strict quality requirements of final testing. The working life depends mainly on the usage conditions. Extreme measuring conditions as for example high or frequently fluctuating temperatures, strong acids and caustic solutions, protein and heavily contaminated solutions, sulfides, bromides and iodides shorten the electrode's working life. Hydrofluoric acid, sodium hydroxide and hot phosphoric acid attack glass.

Technical details Na 61

pNa range:	0 ... 6
Temperature range:	-10 ... +80°C
Length:	170 mm
Sensor:	Na sensitive glass
Diaphragm:	platinum
Reference system:	Silamid®
Material:	glass, d = 12 mm
Zero point:	pNa = 2.0
Electrolyt:	3 M KCl
Irrigation fluid:	0.1 M NaCl
Connection cable:	e.g. L 1 A
Temperature sensor:	no

Order number

Combination electrode	Na 61	285100026
Connection cable	L1A	285122456
Electrolyte 3M KCl	L 3008	285138505
Cleaning solution	L 510	285138538

Further information

Further information can be found in the laboratory catalogue of SI Analytics GmbH.

Subject to technical amendment.