i Osmometer *basic*

Sample volume 100 or 50 µl · Measuring time approx. 1,5 minutes

Simple operation with touch-display and Icon-style · Air cooling
Clear sample identification with input by touch-display
Single-use plastic sample tubes · 3-point variable calibration
Multi level user access

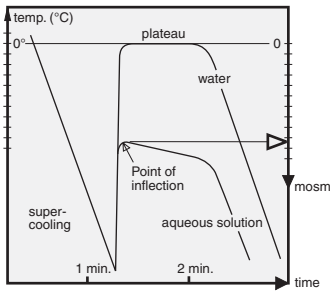
Löser

Measuring Principle

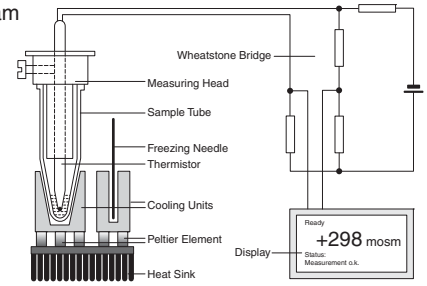
i Osmometer basic

The freezing point of aqueous solutions is measured. The depression of freezing point compared to pure water is direct related to the osmotic concentration. Pure water freezes at 0°C, an aqueous solution with an osmolality of 1 osmol / kg water at –1.858°C. 1 Mol of a substance dissolved in 1 kg of water gives a solution with an osmotic concentration of 1 osmol / kg water only if it is an ideal solution and if the substance does not dissociate.

Typical cooling curves of water and aqueous solutions



Schematic diagram



Function and Description

The sample (serum, blood, urine or any other aqueous solution) is filled in a plastic sample tube and cooled via a Peltierelement. These are semiconductor devices, which become cold on one side and warm on the other when electrical current flows through. The cold side cools the sample whilst the heat from the warm side dissipates into the air by convection.

The Löser-Osmometer transports the warmth via cooling surfaces into the atmosphere, an extra water supply is not necessary. Operation of the instrument requires only an electrical socket. The temperature on the cold side is kept electronically constant.

During the measuring process the temperature of the sample is measured by a thermistor (a temperature dependent resistor). This is part of the measuring head onto which the tube is placed.

The measuring head is attached to guide rods which protect it from accidental damage.

At a defined supercooling the freezing process is started by lowering a needle with ice crystals into the sample tube. The freezing point of the sample is reached.

The method of initiating the freezing process is important for the reproducibility of measurements. Dipping a needle with ice crystals into the sample gives more exact results than stirring with a wire which is constantly dipping into the sample. Because of linear correlation between osmolality and freezing point the measurement of freezing point is a determination of osmolality. The results are displayed as mosm / kg H_2O.

Technical Data

Sample volume: 100 µl or 50 µl

Measuring time: approx. 1.5 minutes (100 µl)

Reproducibility: ± 0,5% (100 µl), ±1 % (50 µl)

Measurement range: 0 … 2500 mosm / kg H_2O

Measurement display changeable (mosm / m°C / %0,9NaCl)

Measurement memory: 100 measurements with sample numbers

Data interfaces: 1x USB/RS 232 for PC or printer

Power supply: 100- 230V AC approx. 75 VA

Dimensions: Width 190 mm, height 278 mm, depth 216 mm

Weight: approx. 4.1 kg The Instrument is CE-labelled

Accessories included:

50 plastic tubes, 2x10 vials of standard solution 300 and 900 mosm / kg H_2O, Spare thermistor, spare needle, spare fuses, little awl for cleaning needle hole, USB/RS232 cables and data transmitting program, operating instructions.

Subject to technical changes (06.04.2020).

Calibration

The zero point is calibrated with distilled water and a standard point with the NaCl-solution of 300 mosm / kg H_2O supplied. Occasional checks shows that the calibration is very stable. An additional 900 mosm-solution can be used to calibrate, whereby the linearity is raised by higher concentrations.

The second and third calibration point could be changed by user to meet other standard concentrations.

Special Features and Advantages

- Touch operation with Icon-style on a wide black & white graphic LC display.
- Selectable languages.
- Multi level user access with passwords and usernames.
- Single use plastic tubes.
- Input of sample numbers with touch-display.
- Reduced operating costs as no extra water supply is necessary.
- Wide input voltage range 100-230 V AC suitable for all countries.
- Reasonable price.

Operating of the Instrument

- Switch on instrument, wait for ready display (approx. 3 minutes).
- Place 100 µl sample in the sample tube (± 10 %).
- Place the sample tube onto the measuring head.
- Lower the measuring head. The sample tube is dipped into the cooling slot.
- Enter sample number using the touch-display. These entries can also be made after measurement.
- Superercooling is reached after 1 minute and the needle with the ice crystals is dipped into the sample.
- As freezing point is reached, the display shows the measurement value in mosm / kg and the instrument gives an audible tone. The measurement value is stored in the memory.
- Slide measuring head from cooling slot and remove the sample tube. Result will be sent by interface.
- Wipe the thermistor with a soft tissue.

Extra Accessories:

- Analogue output for XY-plotter
- Calibration solution 300 and 900 mosm / kg H_2O

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06.04.2020