Cryometer for Benzene Type 20

AUTOMATIC



Sample volume 150 µl · Measuring time approx. 1,3 minutes

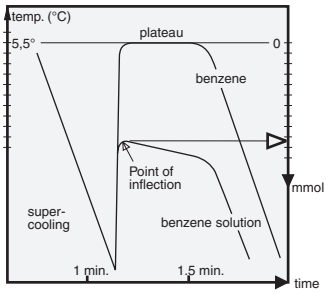
Simple operation with menu-led display · 3-point calibration
Clear sample identification with keyboard and time clock
Single-use plastic sample tubes · Air cooling

Löser

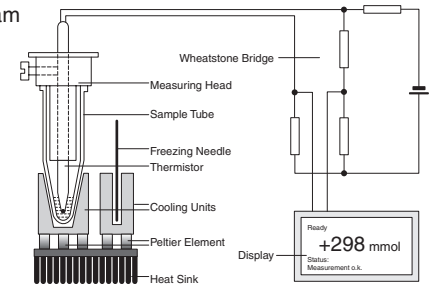
Measuring Principle

The freezing point of benzene solutions is measured. The depression of freezing point compared to pure benzene is direct related to the molale concentration. Pure benzene freezes at +5.5°C, a benzene solution with an molality of 1 mol / kg benzene at +0.38°C.

Typical cooling curves of benzene and benzene solutions



Schematic diagram



Function and Description

The sample 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-Cryometer 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 molality and freezing point the measurement of freezing point is a determination of molality. The results are displayed as mmol / kg C_6H_6.

Technical Data

Sample volume: 150 µl
Measuring time: approx. 1,3 minutes
Reproducibility: ± 1%
Measurement range: 0 … 1000 mmol / kg C_6H_6
Measurement memory: 100 measurements with sample numbers
Data interfaces: 3 x RS 232 for printer, handscanner and PC
Power supply: 230V AC (100/115V AC on request) approx. 45 VA
Dimensions: Width 180 mm, height 278 mm, depth 216 mm
Weight: approx. 6,3 kg
The Instrument is CE-labelled

Accessories included:
50 plastic tubes, spare thermistor, spare needle, spare fuses
Cleaning fluid and little funnel for cleaning needle hole
Data transmitting cable and program
Operating instructions

Subject to technical changes.

Calibration

The zero point is calibrated with pure benzene and a standard point with a standard solution 200 mmol. Occasional checks show that the calibration is very stable. An additional 400 mmol solution can be used to calibrate, whereby the linearity is raised by higher concentrations.

Special Features and Advantages

- Menu led operation on a wide illuminated LCD graphic display.
- Selectable language.
- Single use plastic tubes.
- Blocking of measuring tube or needle by freezing in stand-by mode is counteracted by regular automatically defrosting.
- Needle aperture can be rinsed with water or benzene.
- The parameters of the RS232 interfaces can be configured via the menu.
- Integrated real time clock to sort measurements and calibrations.
- Reduced operating costs as no extra water supply is necessary.

Operating of the Instrument

- Switch on instrument, wait for ready display (approx. 3 minutes).
- Place 150 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 keyboard or the handscanner. These entries can also be made after measurement.
- Supercooling 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 mmol / 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.
- Wipe the thermistor with a soft tissue.

Extra Accessories:

- Barcode-handscanner for reliable and fast registration of samples
- Dot-matrix printer for results
- Analogue output for XY-plotter

Löser Messtechnik, Axel Löser www.loeser-osmometer.de
D-13589 Berlin (Germany), Kaiserstrasse 24, Phone +49(0)30 / 814 73 17-0, Fax +49(0)30 / 814 73 17-1

28.4.2006