MEASUREMENT OF PRESSURE CHANGE WITH TEMPERATURE CHANGE

MED 16.04b

Material:

Item-no.	Qty.	Description
C3020-6D	1	Erlenmeyer flask glass, 250 ml, SB 29
C7320-4B	1	Stopper silicone, 26/32/30 mm, 1 hole, for SB 29
C6095-1K	1	Tubing connector for di= 7-10 mm
C7445-3S	1	Hose, silicone, D=3/6 mm, L=100 cm
C7414-2C	1	Hot plate, small, 500 W
DE722-2D	1	Manometer, differential, "inno"
P3120-4A	1	L-shaped assembly platform
DE722-1T	1	Thermometer "inno", 1100 °C
P4120-1T	1	Temperature sensor (wire type), NiCrNi, -50/+300 °C
P3120-5B	1	S-shaped assembly platform

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Purpose

Demonstrating that the pressure of a gas increases with temperature and ascertaining the connection.

Preparation

- insert the stopper into the Erlenmeyer flask
- the tip of the temperature sensor should be placed in the centre
- push the tubing connector into the hole of the stopper
  (the connection is supposed to seal as airtight as possible)
- place the “inno” thermometer on the S-shaped assembly platform
- connect the temperature sensor to the thermometer and turn it on
- place the “inno” Manometer on the L-shaped assembly platform and set the measuring range to “100 hPa”
- turn the Manometer on and tare (set to)
- connect the silicone hose to the “overpressure” connector of the Manometer

Experiment

Turn on the hot plate and set the heating switch to the highest level.

Result

The air inside the Erlenmeyer flask is heated up.
The increase in temperature of the gas causes an increase in pressure.

Attention!

The Erlenmeyer flask gets very hot!
Therefore use gloves when dismantling the experiment.

Let the flask cool down slowly after switching off the heating plate.

Do not rinse with cold water when hot.

Note

Convert to Kelvin to show pressure increase with temperature.
Assuming room temperature (approx. 300K), the pressure increases by a third of its value when the temperature increases by 100° (100K).