1.4.04-00  Viscosity measurements with the falling ball viscometer

Principle:
Due to internal friction among their particles, liquids and gases have different viscosities. The viscosity, a function of the substance's structure and its temperature, can be experimentally determined, for example, by measuring the rate of fall of a ball in a tube filled with the liquid to be investigated.

What you can learn about...
- Liquid
- Newtonian liquid
- Stokes law
- Fluidity
- Dynamic and kinematic viscosity
- Viscosity measurements

Tasks:
1. Measure the viscosity of methanol-water mixtures of various composition at a constant temperature,
2. of water as a function of the temperature and
3. of methanol as a function of temperature. From the temperature dependence of the viscosity, calculate the energy barriers for the displacability of water and methanol.

What you need:
- Falling ball viscosimeter
- Immersion thermostat C10
- Accessory set for TC10
- Bath for thermostat, Makrolon
- Retort stand, h = 750 mm
- Right angle clamp
- Universal clamp with joint
- Pyknometer, 25 ml, calibrated
- Volumetric flasks with standard joint and PP stopper, BDRO 3.3, 100 ml
- Beaker, DURAN®, tall form, 150 ml
- Beaker, DURAN®, short form, 250 ml
- Pasteur pipettes, l = 145 ml
- Rubber caps, 10 pcs
- Hose clip, d = 8-12 mm
- Rubber tubing, d_i = 6 mm, l = 1 m
- Stopwatch, digital, 1/100 s
- Laboratory balance, 120/240/620 g
- Wash bottle, plastic, 500 ml
- Methanol 500 ml
- Water, distilled 5 l

Temperature dependence of the dynamic viscosity $\eta$ of water (o) and methanol (+), respectively.