

## Viscosity measurement with the falling ball viscometer

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### 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.

### Benefits

- Viscosity measurement for two fluids and any mix ratio
- Viscosity measurement for different temperatures possible
- Angle of falling ball viscometer can be changed
- Interdisciplinary use also in applied sciences or physical chemistry

### Tasks

Measure the viscosity

1. of methanol-water mixtures of various composition at a constant temperature,
2. of water as a function of temperature and
3. of methanol as a function of temperature.

From the temperature dependence of the viscosity, calculate the energy barriers for the displace ability of water and methanol.

### Learning objectives

- Liquid
- Newtonian liquid
- Stokes law
- Fluidity
- Dynamic and kinematic viscosity
- Viscosity measurements

## Scope of delivery

Falling ball viscometer	18220-00	1
Thermometer, 24...+ 51 °C, for Falling ball viscometer	18220-02	1
Immersion thermostat Alpha A, 230 V	08493-93	1
Cooling coil for thermostat Alpha A	08493-01	1
External circulation set for thermostat Alpha A	08493-02	1
Bath for thermostat, makrolon	08487-02	1
Retort stand, h = 750 mm	37694-00	1
Right angle boss-head clamp	37697-00	1
Universal clamp with joint	37716-00	1
Pycnometer, calibrated, 25 ml	03023-00	1
Volumetric flask, Borosilicate, 100 ml, IGJ12/21	36548-00	1
Beaker, Boro, high-form	46032-00	1
Beaker, boro, low-form	46054-00	1
Pasteur pipettes, 250 pcs	36590-00	1
Rubber caps, 10 pcs	39275-03	1
Rubber hose	39282-00	6
Digital stopwatch, 24 h, 1/100 s and 1 s	24025-00	1
Wash bottle, plastic, 500 ml	33931-00	2
Methanol 500 ml	30142-50	2
Water, distilled 5 l	31246-81	1
Hose clamp for 8-12 mm diameter	41000-00	10
Rubber hose	39290-00	1
Tubing connector, ID 6-10mm	47516-01	2