

## Viscosity of Newtonian and non-Newtonian liquids (rotary viscometer)

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### Principle

The viscosity of liquids can be determined with a rotation viscometer, in which a motor with variable rotation speed drives a cylinder immersed in the liquid to be investigated with a spiral spring. The viscosity of the liquid generates a moment of rotation at the cylinder which can be measured with the aid of the torsion of the spiral spring and read on a scale.

### Benefits

- Classic experiment to determine the viscosity of a huge variety of fluids
- Watch all results directly on the built-in multilanguage display
- Use several spindles that come with a storage rack
- Wearless torque measuring system with high accuracy
- Digital speed control
- Interdisciplinary use also in applied sciences or physical chemistry

### Tasks

1. Determine the gradient of the rotational velocity as a function of the torsional shearing stress for two Newtonian liquids (glycerine, liquid paraffin).
2. Investigate the temperature dependence of the viscosity of Castor oil and glycerine.
3. Determine the flow curve for a non Newtonian liquid (chocolate).

### Learning objectives

- Shear stress
- Velocity gradient
- Internal friction
- Viscosity
- Plasticity

## Scope of delivery

Magnetic stirrer with heater	35754-93	1
Rotational viscometer	18224-99	1
Right angle boss-head clamp	37697-00	2
Supp.rod stainl.st.,50cm,M10-thr.	02022-20	1
Spring balance holder	03065-20	1
Support rod with hole, stainless steel, 10 cm	02036-01	1
Magnetic stirring bar 30 mm, cylindrical	46299-02	1
Separator for magnetic bars	35680-03	1
Beaker, boro, low-form	46056-00	1
Beaker, Boro, high-form	46027-00	1
Glass rod, boro 3.3, l=200mm, d=5mm	40485-03	1
Glycerol, 250 ml	30084-25	2
Liquid paraffin, thick, 250 ml	30180-25	1
Castor oil 250 ml	31799-27	2
Acetone, chemical pure, 250 ml	30004-25	3