Exp.No. 2: Determining the volumeand density of solids

Objects of the experiments

- Measuring the volumes *V* of different bodies according to the overflow method.
- Comparing the volumes measured with those calculated from the dimensions.
- Determining the density ρ of the bodies.

Principles

The density of a homogeneous substance is usually deter-mined by measuring the mass *m* and the volume *V* separately and then calculating the density

$$\rho = \frac{m}{V} \qquad (I)$$

from these quantities.

The density of solids is determined by combining weighing and a volume measurement. The volumes of the bodies are deter-mined from the volume of the liquid that the bodies displace from an overflow reservoir. This procedure is tested in the experiment with regular bodies whose volumes can be calcu-lated from their linear dimensions.

Setup

– Put a small quantity (approx. 0.1 cm^3) of colouring into the plastic beaker, pour in water, and stir until the colouring has completely dissolved.

– Supply the glass cylinder **(a)** with an overflow tube and a rubber stopper, and put it onto the laboratory stand so that the opening of the overflow tube is placed above the centre of the graduated cylinder **(b)**.

– Pour coloured water into the glass cylinder.

– Fill water into the plastic beaker **(c)** once more, and slowly pour water into the glass cylinder **(a)** until the overflow tube is filled with bubble-free water and the coloured water overflows into the graduated cylinder.

– Empty the graduated cylinder **(b)** (pour the coloured water back into the plastic beaker), and put it back under the opening of the overflow tube.

Table 1: Volume (measured according to the overflow method), dimensions and mass of the test bodies.

Body	Volume	Dimension		Mass g
	V cm^3	d cm	h cm	

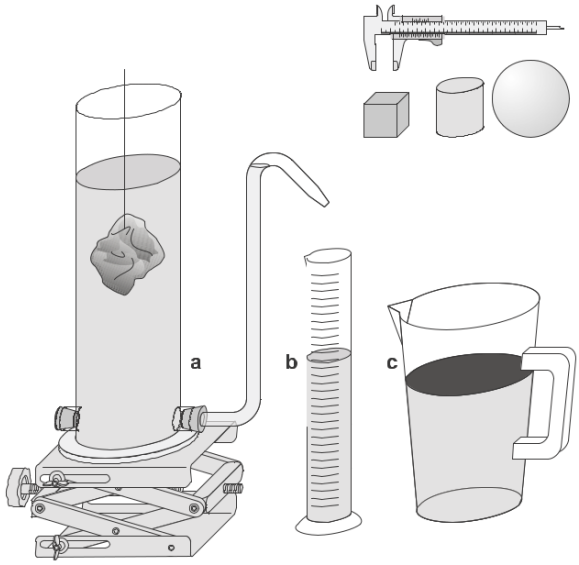
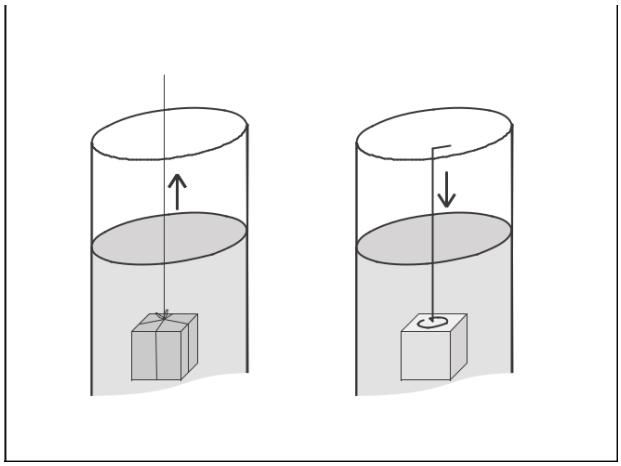


Table 2: Measured and calculated volumes of the bodies.

Body	measured	calculated	Formula

Table 3: Measured and calculated densities

Body	Density g/cm^3